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ABSTRACT

These proceedings contain the agenda, discussants' reports, and 30 papers from the 1983 National Agricultural Education Research Meeting. A discussant's report precedes each group of three papers on one theme and critiques the strengths and weaknesses of the research reported. The 10 themes and representative topics of papers are adult education (exemplary program policies and practices, an adult education program in agriculture); teacher education (occupational market analysis of vocational agriculture teacher education positions, developing and maintaining researchers in agricultural education, national assessment of agricultural education student organizations); vocational agriculture students (leadership and personal development abilities, job placement, horticulture programs for special needs students); supervised occupational experience (relationship to establishment in an occupation, factors associated with participation); a look at vocational agriculture and its components by students, administrators, and teachers (administrator attitudes, student satisfaction); agricultural education graduates (predicting whether graduates will teach, competencies needed to utilize microcomputers); instructional materials (evaluation of materials); vocational agriculture teachers (placement and retention factors; trends in preparation, demand, and mobility; role perceptions); teaching methods/strategies (tolerance and disciplinary effectiveness, teaching livestock skills); and how to improve research in agricultural education (sample size, path analysis). (YLB)

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"Agricultural Education: A look at the Profession"

Proceedings of
The Tenth Annual
National Agricultural
Education Research
Meeting

Anaheim, California
December 2, 1983

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FOREWORD

Research is essential to progress in any profession. This is the basic tenet under which professionals in Agricultural Education launched the regional research conferences and, more recently, the National Meeting.

The National Agricultural Education Research Meeting (NAERM) is unique in its field; no other vocational service area has such a comprehensive meeting dedicated to research and featuring the best studies from across the nation. The 1983 NAERM is the tenth in a distinguished series. Previous meetings were:

Number	Year	Location	Name and Institution of Chairperson
1	1974	New Orleans, LA	Hollie Thomas, Florida State
2	1975	Anaheim, CA	Hollie Thomas, Florida State
3	1976	Houston, TX	Glen Shinn, Mississippi State
4	1977	Atlantic City, NJ	William Richardson, Purdue
5	1978	Dallas, TX	Bennie Byler, Mississippi State
6	1979	Anaheim, CA	Ronald Brown, Mississippi State
7	1980	New Orleans, LA	L.H. Newcomb, Ohio State
8	1981	Atlanta, GA	Maynard Iverson, N. Carolina State
9	1982	St. Louis, MO	Dale Oliver, VPI & SU

The quality tone for the 1983 NAERM was set by those who conducted the previous meetings. I am grateful to a number of individuals who helped make this year's meeting successful: to Dale Oliver, 1982 NAERM Chairman who provided an outstanding example to follow, to Maynard Iverson, Chairperson, AVA Agricultural Education Division (AED) Research Committee whose assistance was essential in conducting the program and compiling these proceedings, to the members of the AVA/AED Research Committee for sponsoring and assisting in conducting the meeting; to Leon Wagley, Head, Department of Agricultural & Extension Education, New Mexico State University, for his support and encouragement in planning and conducting the conference; to a special anonymous friend who provided the Proceedings covers; to Jimmy Cheek, Chairperson Elect, NAERM, who coordinated the assembling of the Proceedings; to the Conference Secretary, Bill Camp, who organized the conference registration; to James Leising, Program Chairperson, AVA/AED, who coordinated the overall program planning; to the participants in the program--chairpersons, facilitators, discussants and speakers--whose efforts resulted in an excellent conference; and to all members of the profession who submitted proposals and permitted their work to be judged by their peers (27 of the 57 proposals submitted were selected for a 47% acceptance rate). Thanks are also due to Carmen Salinas, Crystal Rogers, and Evie Davis from the Department of Agricultural & Extension Education at New Mexico State University for their assistance in handling the volume of work associated with the 1983 meeting.

A special word of thanks is due the following individuals who served as referees and whose work provided the basis for the objective selection of presenters:

Ronald Brown, Teacher Education, Mississippi State
Douglas Bishop, Teacher Education, Montana State
Joseph Cvancara, Teacher Education, Washington State
Larry Case, Supervision, Missouri
Robert Cox, National FFA Alumni Association
Clifford McClain, Supervision, Wyoming
Gary Briers, Teacher Education, Texas A & M
Arthur Purcell, Teacher Education, North Carolina A & T
Layton Peters, Teacher, Minnesota
Marvin Kleene, Teacher Education, Washington State
Larry Miller, Teacher Education, Ohio State
Gilbert Long, Teacher Education, Utah State

I hope that the papers from the 1983 NAERM will prove useful to all who receive them and that all presentors will submit their work for possible publication in a journal. It is time to begin preparing for the 1984 NAERM, and I hope that many of you will submit paper proposals for consideration. Any suggestions you may have for improvement of future meetings will be appreciated.

Paul R. Vaughn
Chairperson, 1983 NAERM

TENTH ANNUAL
NATIONAL AGRICULTURAL EDUCATION
RESEARCH MEETING

December 2, 1983
Disneyland Hotel

Conference Chairperson: Paul R. Vaughn, New Mexico State University
Chairperson Elect: Jimmy G. Cheek, University of Florida
Conference Secretary: William G. Camp, Virginia Polytechnic Institute and State University

FIRST SESSION
North Lounge

8:15 - 8:30 a.m. Topic: Orientation and Introductions

Chairperson: Paul R. Vaughn, New Mexico State University

Facilitator: Susan Camp, Louisiana State University

SECOND SESSION
Concurrent Session A
Santa Rosa Room

8:30 - 10:00 a.m. Theme: A Look At Adult Education

Chairperson: David Coffey, Western Kentucky University

Facilitator: James E. Christiansen, Texas A & M University

Discussant: William B. Richardson, Purdue University

Topic I: Exemplary Program Policies and Practices for Adult Vocational Education

Lowell E. Hedges, Larry E. Miller, Mark Harbaugh, Susan Osborne, Ohio State University

Topic II: The Role of the Agricultural Education Teacher in the Young Farmer Program in Virginia

C. Jordan Hudson, Virginia State University

Topic III: A Study of Adult Education Programs in Agriculture

Alfred J. Mannebach, University of Connecticut

Concurrent Session B
Santa Catalina Room

8:30 -10:00 a.m. Theme: A Look at Teacher Education and its Programs

Chairperson: Ronald J. Seibel, University of Maryland

Facilitator: Vernon Luft, North Dakota State University

Discussant: Don Herring, Texas A & M University

Topic I: An Occupational Market Analysis of Vocational Agriculture Teacher Education Positions

Barbara J. Malpiedi, William G. Camp, Virginia Polytechnic Institute & State University

Topic II: Developing and Maintaining Productive Researchers in Agricultural Education

Maureen E. Kelly, University of Wisconsin-Madison and J. Robert Warmbrod, Ohio State University

Topic III: A National Assessment of Agricultural Education Student Organizations

Mike Rush, John Hillison, Virginia Polytechnic Institute & State University

Concurrent Session C
Santa Cruz Room

8:30 - 10:00 a.m. **Theme: A Look At Vocational Agriculture Students**

Chairperson: Gary Moore, Louisiana State University

Facilitator: Steve Jones, Iowa State University

Discussant: David L. Williams, Iowa State University

Topic I: Leadership and Personal Development Abilities Possessed by High School Seniors Who are FFA Members in Superior FFA Chapters, Non-Superior Chapters, and by Seniors Who Were Never Enrolled in Vocational Agriculture

Samuel C. Ricketts, L.H. Newcomb, Ohio State University

Topic II: Job Placement as Influenced by Agriculture Background of Vocational Agriculture Students

Joseph H. Mick, Bob Stewart, Donald M. Claycomb, University of Missouri

Topic III: A Study of Horticulture Programs in Which Special Needs Students are Enrolled

Joseph J. Nawoczenski, Connie Baggett, Pennsylvania State University

10:00 - 10:15 a.m. REFRESHMENT BREAK

THIRD SESSION
Concurrent Session D
Santa Rosa Room

10:15 - 11:45 a.m. **Theme: A Look At SOE**

Chairperson: H. Robert Terry, Oklahoma State University

Facilitator: Rose Jones, Iowa State University

Discussant: Rosco C. Vaughn, New Mexico State Department of Education

Topic I: Relationship of SOE in Agriculture and Establishment in Occupations

Walter N. Taylor, Virginia State University and Martin B. McMillion, Virginia Polytechnic Institute and State University

Topic II: Factors Associated With SOE in California Vocational Agriculture Programs

James G. Leising, Eric E. Zilbert, University of California, Davis

Topic III: Vocational Agriculture Teacher Characteristics and Their Relationship to Perceptions of SOE Importance, Attitudes Toward Supervision, and Quality of Supervised Occupational Experience Programs

David Harris, L.H. Newcomb, Ohio State University

Concurrent Session E
Santa Catalina Room

10:15 - 11:45 a.m. Theme: A Look At Vocational Agriculture And Its Components By Students, Administrators, And Teachers

Chairperson: Robert W. Cox, National FFA Alumni Association

Facilitator: Kevin Gamble, Iowa State University

Discussant: Larry Miller, Ohio State University

Topic I: Attitudes of Local School Administrators Toward Vocational Agriculture Programs

Michael F. Burnett, Louisiana State University

Topic II: Status and Importance/Support for SOEP as Perceived by New York Vocational Agriculture Teachers and Their Building Administrators

Arthur L. Berkey, H. Dean Sutphin, Cornell University

Topic III: Relationship of Vocational Agriculture Student Satisfaction to Selected Student, School, and Program Variables

Larry R. Arrington, William H. Price, University of Florida

Concurrent Session F
Santa Cruz Room

10:15 - 11:45 a.m. Theme: A Look At Agricultural Education Graduates

Chairperson: John W. Slocombe, University of Idaho

Facilitator: Keith Rheault, Iowa State University

Discussant: Edward P. Yoder, Pennsylvania State University

Topic I: The Professional Preparation, Years of Service and Occupation Entered Upon Leaving the Profession by Agricultural Education Personnel in Ohio: A Log-Linear Analysis

George Wardlow, R. Kirby Barrick, J. Robert Warmbrod, Ohio State University

Topic II: Predicting Whether or Not Agricultural Education Graduates Will Teach--A Discriminate Analysis

Jimmy G. Cheek, Max B. McGhee, Gregory West, University of Florida

Topic III: Competencies Needed to Utilize Microcomputers in Vocational Agriculture

C. Jordan Hudson, Virginia State University

FOURTH SESSION
Concurrent Session G
Santa Rosa Room

1:00 - 2:30 p.m. **Theme: A Look At Instructional Materials**

Chairperson:	Robert A. Martin, Iowa State University
Facilitator:	Larry Haskell, Iowa State University
Discussant:	James A. Knight, Ohio State University

Topic I: Experimental Evaluation of an Instructional Unit on Agriculture/Agribusiness Management

Robert J. Birkenholz, Alan A. Kahler, Iowa State University

Topic II: Experimental Evaluation of an Instructional Packet on Supervised Occupational Experience Placement Programs For Vocational Agriculture

John W. Slocombe, University of Idaho and David L. Williams, Iowa State University

Topic III: An Assessment of Attitudes, Needs, and Delivery System for Microcomputer Applications by Agricultural and Extension Educators in Mississippi

M.J. Cantrell, Pennsylvania State University and Ben L. Byler, Mississippi State University

Concurrent Session H
Santa Catalina Room

1:00 - 2:30 p.m. **Theme: A Look At Vocational Agriculture Teachers**

Chairperson:	Alfred J. Mannebach, University of Connecticut
Facilitator:	Steve Woodley, Louisiana State University

Discussant: Ronald A. Brown, Mississippi State University

Topic I: Oregon Vocational Agriculture Teachers Placement and Retention Factors

Lee Cole, Oregon State University

Topic II: Trends in the Preparation, Demand and Mobility of Ohio Vocational Agriculture Teachers

R. Kirby Barrick, George W. Wardlow, J. Robert Warmbrod, Ohio State University

Topic III: Actual and Desired Role Perceptions of Teachers of Vocational Agriculture

Ismail bin Yahya, Michael F. Burnett, Louisiana State University

Concurrent Session I
Santa Cruz Room

1:00 - 2:30 p.m. Theme: A Look At Teaching Methods/Strategies

Chairperson: Doug Bishop, Montana State University

Facilitator: Tom Grady, Louisiana State University

Discussant: Joe Kotrlik, Louisiana State University

Topic I: Teacher Tolerance and Its Relationship to Disciplinary Effectiveness

L.H. Newcomb, Rosemarie Cundiff, Ohio State University

Topic II: Methods Used For Teaching Livestock Skills in Ohio Vocational Agriculture Programs

Ed Osborne, University of Illinois

Topic III: Time on Task in Vocational Agriculture Laboratories

Janet L. Henderson, University of Illinois

2:30 - 2:45 p.m. REFRESHMENT BREAK

FIFTH SESSION
North Lounge

2:45 - 3:50 p.m. Theme: A Look At How To Improve Research In Agricultural Education

Chairperson: Jimmy G. Cheek, University of Florida

Facilitators: John Hillison, Virginia Polytechnic Institute & State University and Carl Beeman, University of Florida

Topic I: Sample Size for Survey Research: Have You Considered The Type II Error?

J. Dale Oliver, Dennis E. Hinkle, Virginia Polytechnic Institute & State University

Topic II: Path Analysis: Utilizing Theory and Statistics in Analyzing Longitudinal Data in Educational Research

Ben L. Byler, Linda F. Byler, Mississippi State University

Topic III: Presentation Of Award For Outstanding Paper

Jerry Peters, Purdue University

Discussant's Report

Research Reported at
National Agricultural Research Meeting
Anaheim, California
December 2, 1983

By
William B. Richardson
Professor
Department of Education
Purdue University

General Comments

Prior to discussing individual papers, I wish to address three issues that pertain to the papers. First, the researchers provided a minimum amount of documentation and literature review as a part of the papers. Some references were listed in the final sections of the papers with little mention made to them in the body of the papers. I strongly urge the agricultural education community to conduct thorough reviews of the literature and include pertinent reviews in the papers. We should build upon the research already conducted and reported.

Second, each of the papers mentioned the use of a questionnaire to collect data, yet provided little information as to how the questionnaire was developed, validated, and field-tested. If these instruments were developed and tested, such should be reported. If such testing was not completed, it should have been.

Third, in some of the papers, recommendations were made which from my reading could not be substantiated from the reported research. Those editorial comments might best be handled in a discussion section devoted to implications of the research rather than a specific recommendation.

The Mannebach Paper

Overview:

I found the Mannebach article to provide a good model for other states to follow in establishing a data base for adult education. The article included data collected from teachers, farmers, and from the agriculture business firms in Connecticut. I commend him for this effort and encourage those of you charged with the progress of adult education in your state to examine Dr. Mannebach's study.

Strengths:

The study was well written. I found the article to flow from section to section. Generalizations were kept to a minimum. The discussion section allowed the writer to discuss the results in a futuristic context. The thrust of the research, as I noted earlier, is important and raises many questions for the rest of us to consider.

Improvements:

The documentation in the article could be increased. I was also concerned that the procedure for developing, testing, and validating the questionnaire was vague. Also, a question in my mind arose as to why the researcher chose the number of individuals or agencies to sample. Was a straight-line percentage chosen or was a scientific method used to choose the sample size? There are formulas to follow to select sample size. Although the response rates reported were good, given the mailed survey technique, the paper did not report any attempt to contact nonrespondents.

Summary:

There were two questions in my mind that resulted from reading this paper. First, given the documented needs for adult education in Connecticut, how much of these needs are the direct responsibility of vocational agriculture? Could not other agencies be responsible for a share of those training needs, i.e., extension. Second, given the demands of high school teaching, can we really expect a full-time teacher to take on a part-time job and teach adults in an effective manner? And, given the time and budget restraints mentioned in the paper, can we expect schools to hire full-time adult instructors? Are we not in a "catch 22" position with regard to adult instruction and is this why adult programs suffer in many areas?

The Hudson Paper

Overview:

This paper reports an applied piece of research aimed at the practitioner. The researcher conducted a valuable piece of research using minimum resources. The results will be valuable to upgrading the approach to adult instruction in Virginia.

Strengths:

The strength of this paper is in the utility of the findings for teachers. The practical nature of the research makes it a valuable resource for teacher education programs. It can be repeated in other settings.

Areas of Improvement:

The paper that I reviewed needs some editorial revision to tighten up the writing. The introductory section especially was confusing. The writer followed a sound procedure in developing the instrument. The instrument was field tested and revised. However, little mention was made about how the instrument was actually designed and how validity and reliability checks were made.

My major concern with the paper, however, deals with the conclusions and recommendations sections. First, I was concerned about the conclusion that "The young teachers who provided the data were qualified by their experience to make valid judgements on all procedures used in this study." Does experience alone, be it good or poor, makes someone, especially a young teacher, qualified? And, reading through the paper, the teachers were asked not to rate procedures that they had not used. I question the first conclusion. It could be that I misunderstood the intent of the conclusion. In the recommendations section, it was stated that, based on this study, "the inservice training guide for young farmer programs should be revised to include the procedures which were identified and recommended in this study." Yet, I find no reference to an inservice training guide in the study. This leads me to believe that the writer, while making a good suggestion, cannot substantiate the recommendation. I would prefer the use of an additional discussion section that allows the writer to discuss and suggest other implications of the research.

The Hedges (And Others) Paper

Overview:

This paper provides a comprehensive view of adult education policies and practices. The approach used is transportable to other settings.

Strengths:

The paper reports a well-designed research project. It is well written. I especially want to highlight the criteria and procedure used in selecting the exemplary programs that were studied, as the researchers followed a sound procedure. The paper itself focuses on the findings, conclusions and recommendations, with a limited amount of other filler material.

Areas of Improvement:

The instruments and inverview schedule used were reported as being valid and reliable. Some information on the procedure used to validate and determine the reliability of the instrument would add to the paper. I had difficulty with the first recommendation under the administration section. I could not trace that recommendation to the findings of the study. I would also like to see the findings and conclusions separated into two distinct sections as I had difficulty distinguishing between a finding and a conclusion. It may have been helpful to add a discussion section to summarize the salient points in the research.

Suggestions:

As a suggestion, I would encourage the researchers to develop a model for adult education program policies and practices based on this study. The thorough nature of the research provides a valuable set of statements that the rest of the profession could use in designing adult education programs.

EXEMPLARY PROGRAM POLICIES AND PRACTICES
FOR
ADULT VOCATIONAL EDUCATION

Presenter: Dr. Lowell E. Hedges
Assistant Professor
Department of Agricultural Education
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Co-Investigator: Dr. Larry E. Miller
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EXEMPLARY PROGRAM POLICIES AND PRACTICES FOR ADULT VOCATIONAL EDUCATION

INTRODUCTION

An urgent need exists on a nationwide basis to inquire into adult vocational education. Due to advances in technology, high levels of unemployment and expansion of homemakers into the work force, adult vocational education is a rapidly growing field. With a declining birth rate and extended life expectancies, adult vocational education must be viewed as a means of utilizing present public school facilities in the interests of the public good. Ohio, alone, has invested almost six hundred million dollars in vocational education facilities which can offer an abundance of opportunities for training adults.

Ohio's statewide plan for vocational education states that training programs will be provided to adults on a full-time basis, as well as on an hourly basis. Adults who can benefit from these training programs are defined as individuals who are at least sixteen years old and not regularly attending high school classes. The philosophy of the Vocational Education Division of the Ohio Department of Education reflects a mandate by the state legislature stating that adult vocational education should be involved in the training, retraining, and upgrading of seven percent of the total working population.

OBJECTIVES OF THE STUDY

The purpose of this study was to describe the policies and procedures that have been followed by selected exemplary adult vocational education programs in Ohio. Recommendations were formulated to assist other schools in developing more effective adult vocational education programs. The objectives were to describe the school-wide aspects, the specific programs and innovative practices followed by Ohio exemplary vocational education adult programs.

One effective way to improve practices in adult vocational education throughout Ohio is for planning districts to look at the actual work done by examplary programs, rather than study theoretical policies found in much of the existing literature. In this manner, planners would be made aware more quickly of innovative practices and thus be able to successfully react to emerging trends and changing areas of emphasis that lie ahead for vocational education.

METHODS AND PROCEDURES

Five exemplary vocational education planning districts in Ohio were selected by an advisory council that included representatives from the

Joint Vocational School Superintendents, Ohio Advisory Council for Vocational Education, State Supervisory Staff in Adult Education from the Division of Vocational Education, and a teacher representative of the Adult Education Division of the Ohio Vocational Association. Criteria for the selection of the exemplary adult vocational education planning districts included:

1. *Sufficient evidence of the exemplary nature of the program existing through the involvement of business and industry, high percentage of adults served, high placement for exploratory and new entry programs, and high level of success with skill development for enhancing employment opportunities.*

2. *Representation of urban and rural enrollers occurring such that large metropolitan, middle-sized urban, and rural districts were represented, and geographical distributions were considered.*

3. *Representation of programs fulfilling a variety of employment purposes such that preparatory, supplemental, apprenticeship and special service programs to meet the needs of the unemployed, underemployed, displaced homemakers, pre-retirement, dissatisfied, exploratory and supplemental enrollers were represented. The supplemental needs group was defined as students wishing to increase their knowledge and skills to advance within their jobs or add income through efficient production.*

Quantitative data and qualitative information were collected through reliable and valid questionnaires and interview schedules. Data analysis was descriptive in nature and presented a case-by-case summary of each exemplary program. A synopsis of commonalities and disparities between and among the examplary programs was prepared. Chi Square and correlations were utilized to determine the relationship between selected attribute variables and characteristics of subjects.

Data Sources

The five exemplary programs included in this study involved 34,618 students with 5,291 of them enrolled on a full-time basis. The total number of instructors was 832, with 150 employed full-time.

1. *Student data: A random sample of adult students, stratified by program area, was selected within each exemplary planning district. Data were gathered from returned questionnaires from adult students attending classes during April and May of 1981.*

2. *Instructor data: Data were collected from responding current instructors of all types within each exemplary planning district by means of a questionnaire.*

   Due to the varied teaching schedules of adult instructors (e.g., part-time, evening, short-term), data were obtained from those *instructors currently teaching at the time of survey distribution (May-June, 1981). Data reported and analyzed were obtained from the adult instructors who responded to the survey instrument. Inferential statistics were used to determine statistically significant relationships, if any, existing between variables included in the instruction portion of the study. The Chi Square test for independence was used to analyze the evidence of association. Pearson Product Moment Correlation Coefficients were also computed.*

3. *Administrator data: The personal interviews with the school directors and other administrators were audio taped. The interviews were used to obtain background information about each district such as the district's philosophy of vocational education; administrative and organizational structure; duties and activities of the director/supervisor of adult education programs; budget development and administration; adult vocational education personnel; promotional/recruitment activities; coordination efforts with other national, state and local programs involved in employment training; business, industry, labor, and adult vocational education cooperation efforts; the involvement of advisory groups; program evaluations; counseling and assessment; and activities to expand and develop adult vocational education programs. Content analysis was employed to organize the qualitative content and glean congruent and dissimilar practices and policies followed in the districts.*

4. *Employer data: Information concerning adult vocational education programs was obtained from responding employers stratified by type of program.*

RESULTS: FINDINGS, CONCLUSIONS, RECOMMENDATIONS

The conclusions and recommendations are based upon the findings in this study of five exemplary programs. It is significant that the conclusions and recommendations made are consistent with the philosophy of adult education of the Division of Vocational Education of the State Department of Education.

Findings and Conclusions

Administration and Coordination

1. *All planning districts had a full-time supervisor/director responsible for adult programs, and employed both full-time and part-time adult vocational education instructors.*

2. *Responsibilities of administrators of adult vocational education programs in each planning district did not encompass secondary programs; however, there was a cooperative relationship in conducting the total school program.*

3. *A separate budget for adult vocational education approved by the Board of Education was developed and implemented in each planning district.*

4. All planning districts utilized craft advisory committees for each adult vocational education program. The districts also maintained a general advisory committee for the entire adult vocational education program.

5. Expansion and development of adult vocational education programs in all planning districts was augmented by:

    a. Cooperative support from the superintendent and board of education.
    b. A diversity of funding sources supplying program support.
    c. High quality instructors with positive attitudes who seek constant improvement.
    d. Receptivity of business and industry, as well as private community members, to the total adult education program.

6. A positive reputation, developed by the adult program, was essential to its success.

7. All planning districts cooperated with local business and industry by providing training programs for employees both in the school and at the business location.

8. Over one-half of the employers reimbursed employees for tuition and other costs, and provided employees release time from work to attend vocational/technical classes as incentives to improve their skills.

9. The use of employer facilities as a classroom or laboratory was a common cooperative relationship.

10. All planning districts cooperated extensively with community agencies such as the Bureau of Vocational Rehabilitation, Veterans Administration, Welfare Services, and Comprehensive Employment and Training Act (CETA).

11. All planning districts supported the efforts of Ohio's newly established Vocational Education Planning District (VEPT) consortia. Utilization of the VEPD consortia was expected to help improve communications and increase the awareness and knowledge of local vocational training programs.

12. In some planning districts, organized efforts to cooperate with area community colleges and technical schools was limited.

Program

1. The major reasons adult students attended vocational/technical classes were to improve job skills and to prepare for a career or job change. The factor that most often influenced adult students to attend vocational/technical classes was a felt, personal need for job skill development.

2. *All planning districts offered short-term hourly and long-term, full-time vocational programs at various times to accommodate students.*

3. *Two-thirds of the adult instructors used competency based education curricula in their adult classes. Nearly all instructors employing such curricula believed it is an effective adult strategy.*

4. *Each planning district had both formal and informal methods of evaluating adult vocational education programs. Factors considered in evaluation include the job placement rate of graduates, enrollment figures, student evaluations of the instructor and course content, and student attrition rates from the programs.*

5. *Adult instructors are involved in course development activities on a limited basis. However, qualitative data gathered in the study lead to the conclusion that these course development activities are being conducted by administrative and support personnel.*

6. *Full-time teachers spend a greater percent of time, than part-time teachers, supervising individuals working on projects or at cooperative training stations. Full-time teachers also spend a greater percentage of their classroom time lecturing than part-time teachers.*

7. *Full-time teachers are more heavily involved than part-time teachers in job placement of adult students, coordination of courses with local employers, completion of adult student follow-up surveys, and work with advisory committees.*

8. *Some counseling and assessment is provided for adult students in each planning district. However, the type and extent of counseling varied greatly from district to district.*

9. *Four of every ten adult students received counseling assistance with course selection decisions. All students who received course counseling felt it was beneficial. Nearly two-thirds of the adult students not visiting a counselor expressed a desire for such assistance.*

Instructors

1. *The board of education formally employs candidates for adult vocational education teaching positions. Applicants are interviewed by the director/supervisor of adult vocational education, who recommends one candidate for final approval.*

2. *Over one-half of the adult instructors learned of teaching positions by being personally contacted by school personnel or administrators. Part-time and full-time teachers vary in the method by which they became aware of their present teaching position. Full-time teachers most often became aware of their teaching position through contact made by school personnel. However, three major*

recruitment methods (submitted application, contact by school personnel, and heard about position from an acquaintance) served as the part-time teachers' source of information about teaching positions.

3. *Adult full-time instructors' salaries in each planning district were based upon the same salary schedule as secondary instructors and are established by the board of education. In most districts, part-time adult instructors received an hourly wage.*
4. *Most of the teachers in agriculture, home economics, business and office, and distributive education had at least a bachelor's degree; only one-fourth of the trade and industrial education teachers had a bachelor's or master's degree.*
5. *Adult instructors accumulated a considerable number of years of related work experience. Nearly two-thirds had over ten years, and another one-fourth had five to ten years of related work experience.*
6. *Occupational skills were updated by exchanging ideas with other instructors, reading trade publications, attending college classes and trade workshops, and working in the trade area during the summer.*
7. *Adult instructors updated their instructional skills primarily by attending college classes and school sponsored inservice workshops.*

Students

1. *Recruitment of students in the planning districts included the following methods: direct mailing of brochures, radio and television spot announcements, newspaper ads, fliers, promotion by course instructors, and word-of-mouth.*
2. *Each district required that students enrolling in adult vocational education programs be at least 16 years old, and not be enrolled in a regular secondary school program. Exceptions to this policy were sometimes made after individual analysis.*
3. *Adult students generally planned to complete one or two courses to accomplish their current educational goals.*
4. *About one-half of the adult students enrolled during daytime hours (8:00 a.m. to 4:00 p.m.).*
5. *About 60 percent of the adult students did not pay any of the program costs. Of those paying some costs, about one-third paid all of their tuition costs, while about two-thirds of the students received some employer or other support.*

6. *Two-thirds of the adult students were unemployed. (It is assumed that this finding identified in April and May is not typical of adult vocational education in general. The number of full-time adult students -- two thirds of the students responding -- as well as the involvement with CETA programs, may have accounted for the larger number of unemployed students).*

Recommendations

The recommendations are prompted by the findings and conclusions of this study. In the judgment of the Advisory Council, the recommended policies and practices may be helpful in expanding and improving adult programs in vocational education in Ohio.

Administration and Coordination

1. *Adult vocational education programs should have a delivery system which is administered separate from the secondary school program, although it should be well coordinated with the total school program.*

2. *Every planning district should have a full-time adult vocational education administrator/supervisor whose responsibilities involve only adult programs.*

3. *Adequate adult vocational education program budgets, derived from a variety of funding sources and approved by the Board of Education, should be developed and implemented separately from the secondary program. Changing state statutes to allow local funds to be used for adult education should be examined due to its importance and growth.*

4. *With decreasing high school enrollments resulting in empty buildings and some unused space in classrooms and laboratories, the Administration should give consideration to providing adult education with the possibility of offering more programs during prime daylight hours.*

5. *Vocational education planning districts should work closely with local employers in relationships such as: development of courses and curricula, use of employer facilities as a classroom or laboratory, recruiting students and providing some tuition support for selected employees, and placement of students.*

6. *Coordination with other training and community agencies, such as CETA, Veterans Administration Bureau of Vocational Rehabilitation, and Consortia should be emphasized.*

7. *There should be more cooperation between public adult vocational education programs and post secondary community colleges and technical schools in the coordination of vocational training programs.*

8. *Craft/general advisory committees should be a supportive element in all of the adult vocational education programs.*

9. *Generally, students in adult vocational education should be at least 16 years of age and not regularly enrolled in a secondary program.*

Program

1. *Programs of adult vocational education should give emphasis to meeting personal needs such as preparing for a career or job change. The program should be offered on both a full-time and a part-time basis at various times with some flexibility in time of enrollment and completion of program to accommodate the students.*

2. *A variety of recruitment efforts, in coordination with employers and community agencies, including brochures, newspaper ads, radio and TV announcements, and personal contact should be used to acquaint adults with vocational education opportunities.*

3. *Adult instructors should become more involved in course development activities such as recruitment, working with advisory committees, coordination of courses with local employers, and placement of students.*

4. *Adult instructors should be encouraged to use competency based curricula, more small group and individual demonstrations, and to spend a greater percent of their time supervising individuals working on projects or at the cooperative training stations.*

5. *School districts should provide counselors and materials to assist adult vocational education students in reaching wise decisions.*

6. *Adult vocational education programs should be evaluated informally through the year, with a more formal evaluation conducted on an annual basis to include such factors as job placement, enrollment, student attrition, appropriateness of course content, and teacher competence.*

Instructors

1. *Planning districts should hire both full-time and part-time instructors to coordinate long-term, full-time and short-term hourly adult programs.*

2. *School personnel should develop a systematic procedure for identifying and recruiting potential teachers.*

3. *Planning districts should conduct school sponsored inservice workshops and provide adult teachers the opportunity to attend college or university classes as a means of updating teachers' instructional skills.*

4. *Adult instructors should have occupational work experience in the field in which they are teaching and be provided opportunities to update their occupational skills.*

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THE ROLE OF THE AGRICULTURAL EDUCATION TEACHER IN THE YOUNG FARMER PROGRAM OF VIRGINIA

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INTRODUCTION

The young farmer program is but one phase of the total agricultural education program in Virginia. In most secondary school programs it compliments the in-school and adult aspects of the program. Some instruction in conducting young farmer programs is provided for the undergraduate. However, the primary college instructional emphasis is on the in-school facet of the program.

As the author of this study attempted to guide the development of a class preparing to teach young farmers, the idea for this study was developed. An abundance of suggested methods and techniques to use in conducting young farmer programs was found. However, which of these procedures should the inexperienced teacher use? Would the new teacher have to experiment with many procedures for several years to find out which methods were the best? This study was an attempt to answer and provide guidance to those teachers having these types of questions.

OBJECTIVES

The major objective of this study was to determine the role of the agricultural education teacher in the Young Farmer Program of Virginia.

Specifically, the study was designed to:

1. Determine the extent to which agricultural education teachers in Virginia are using certain procedures in conducting their young farmer programs.

2. Determine the effectiveness of the procedures being used in conducting young farmer programs in Virginia.

3. Compile a data base from which a practitioner's guide can be developed and used (1) as a basic format for the Agricultural Education 341 course at Virginia State University, (2) in the agricultural education student teacher program at Virginia State University, and (3) by teachers of agricultural education in Virginia.

METHODS AND PROCEDURES

1. A role evaluation instrument was developed through a review of an ERIC search, pertinent periodicals, and copies of unpublished studies conducted by teacher training institutions offering agricultural education programs.

2. Cooperation was secured from the associate director and the supervisors of agricultural education within the State. Each supervisor identified several teachers within his area who operated outstanding young farmer programs.

3. Interviews were conducted with six young farmer teachers (one within each supervisory area) to test the questionnaire and make revisions.

4. The following five categories were used for clarification and ease of understanding:

   a) Locating and Enrolling Members
   b) Determining Instructional Needs
   c) Planning Instructional Programs
   d) Providing Instruction
   e) Evaluation

5. All teachers with one or more years of young farmer teaching experience were asked to complete the questionnaire at an area meeting. A total of 83 young farmer teachers participated in the study, representing approximately 80% of the department with young farmer programs.

6. The respondents were asked to respond to statements about their experience in teaching young farmers. If they had not used the procedure, they were not requested to rate it.

7. The ratings were recorded on a one to five scale signifying opinions ranging from "not effective" to "very effective". From the teachers' ratings the procedures were ranked by category according to their mean effectiveness scores.

8. From an analysis of the data, recommendations were made as to which procedures should be used in conducting the young farmer phase of the agricultural education program in Virginia.

RESULTS

Procedures Used in Locating and Enrolling Members

The following procedure was rated above average in effectiveness in locating and enrolling members and was being used by 79 (95%) of the young farmer teachers:

> Personal contact, face to face, by the instructor on the member's farm or business.

The following eight procedures were rated average in effectiveness and were being used by more than 50% of the young farmer teachers in locating and enrolling members (listed in order of importance):

1. (Contact) Present young farmer members.

2. (Contact) Former students.

3. Invite members through use of phone calls.

4. (Contact) Adult farmers.

5. Obtain necessary administrative approval and support -- discuss potential advantages to the school.

6. Invite members through use of post cards.

7. Invite members through use of letters.

8. (Contact) Members of community organizations.

The following four procedures were rated below average in effectiveness and were being used by more than 50% of the young farmer teachers (listed in order of importance):

1. Conduct a membership drive each year.

2. (Contact) Advisory council members.

3. (Contact) Other teachers.

4. Invite members through the use of newspaper announcements.

Procedures Used in Determining Instructional Needs

The following procedure was rated above average in effectiveness in determining the instructional needs and was being used by 78 (94%) of the young farmer teachers:

Survey present members.

The following 16 procedures were rated average in effectiveness and were being used by more than 50% of the young farmer teachers (listed in order of importance):

1. Consider the objectives of agricultural agencies such as the Agricultural Extension Service, Soil Conservation Service, etc.

2. Consider the economic goals of the members.

3. Consider the work experience of the members.

4. Survey successful farmers.

5. Survey teachers with existing programs.

6. Survey successful agricultural businessmen.

7. Review the previous years instructional programs to determine what has been taught, previous problems discussed, and the results obtained.

8. Participate in community activities.

9. Survey specialists from agricultural agencies.

10. Consider the education level of the members.

11. Consider the objectives of local farm organizations.

12. Use data secured from farming programs of members - such as production yields in relation to county and state average.

13. Survey advisory council members.

14. Consider the family goals of the members.

15. Survey former members.

16. Consider the social goals of the members.

Procedures Used in Planning the Instructional Programs

The following three procedures were rated above average in effectiveness and were being used by more than 50% of the teachers (listed in order of importance):

1. Include recreation and social gatherings with families of members during the year.

2. Keep objectives simple.

3. Hold an annual banquet.

The following 23 procedures were rated average in effectiveness and were being used by more than 50% of the young farmer teachers (listed in order of importance):

1. Include tours of selected farms or businesses.

2. Prepare a list of topics or subjects from which the members can choose.

3. Provide proper ventilation, good lighting, adequate heat, and comfortable seats informally arranged.

4. Have planning or executive committee study the needs of the group and submit the proposed activities to the membership for final acceptance.

5. Schedule tentative dates according to logical sequence, seasonality and number of sessions needed for each subject.

6. Schedule meetings far in advance and be very hesitant to switch dates of meetings and activities.

7. Send copies of program of activities to members.

8. Include activities on improving the home farm during the year.
9. Work closely with FFA-related activities.
10. Include community service activities during the year.
11. Have each member serve on at least one committee and be charged with carrying out certain activities.
12. Utilize specific committees to carry out young farmer functions.
13. Send copies of program of activities to consultants, specialists and resource personnel.
14. Hold regular meetings of the executive committee to plan meeting agenda.
15. Include competitive events during the year.
16. Hold joint meetings with other agricultural groups during the year.
17. After a resource person has made a presentation, the instructor should plan to summarize the presentation.
18. Include leadership activities during the year.
19. Have members attend state and national meetings and report to local chapter.
20. Send copies of the program of activities to the school administration.
21. Include cooperative buying or marketing activities during the year.
22. Prepare news articles for the local paper.
23. Invite state officers to speak to the group.

Procedures Used in Providing Instruction

The following 11 procedures were rated above average in effectiveness and were being used by more than 75% of the young farmer teachers (listed in order of importance):

1. Use resource persons.
2. Use demonstrations.
3. Encourage informality by making all members feel welcome and a part of the group.

4. Use field trips.
5. Use less formal teaching techniques than for high school classes.
6. Encourage informality by the use of first names.
7. Use informal discussions.
8. Encourage informality by providing light refreshments.
9. Use tours.
10. Be careful not to "talk down" to members.
11. Encourage informality by learning the name of each member as soon as possible.

The following 33 procedures were rated average in effectiveness in providing instruction and were being used by more than 50% of the young farmer teachers (listed in order of importance):

1. Avoid monopolizing the discussion.
2. Begin and close on time.
3. Encourage informality by informal seating arrangements.
4. Encourage informality by informal dress.
5. Speak to the class rather than to the chalkboard.
6. Use a variety of instructional methods.
7. Use on-farm instruction.
8. Create a learner-centered atmosphere by being a good listener.
9. Present lessons in simple, understandable terms.
10. Create a learner-centered atmosphere by encouraging everyone to participate.
11. Encourage everyone to speak loud enough to be heard.
12. In discussions, use words that are familiar, short, vivid, and accurate.
13. Use group projects.
14. Create a learner-centered atmosphere by encouraging members to share experiences.
15. Use emphasis in the voice to avoid monotone.

16. Deal with the actual problem and use common materials for purposes of illustration.
17. Conduct meetings with dispatch, yet with consideration and courtesy to all.
18. Avoid repetition of "pet" words or phrases.
19. State the title of the topic in concise understandable terms that are meaningful to the learners.
20. Create a learner-centered atmosphere by involving members in group interaction.
21. Create a learner-centered atmosphere by encouraging members to ask relevant questions.
22. Use a subject-related joke when needed to arouse fresh interest.
23. Create a learner-centered atmosphere by fostering a "one for all and all for one" spirit among the group.
24. Follow your teaching plan to prevent wandering from the subject.
25. Provide for small group or individual instruction as needed.
26. Personalize the instruction by using the possessive form of "you".
27. Proceed from the easy to the difficult and simple to complex.
28. State thoughts positively without being dogmatic.
29. Create a learner-centered atmosphere by expressing a desire to take class members into partnership as teachers.
30. Create a learner-centered atmosphere by finding out what each person already knows.
31. Use a lecture with a question and answer session afterwards.
32. Provide a display of current agricultural magazines.
33. Conduct meetings according to correct parliamentary procedure to insure fairness and efficiency.

Procedures Used in Evaluation

The following seven procedures received an average rating in effectiveness and were being used by more than 50% of the young farmer teachers (listed in order of importance):

1. Use findings of the evaluation to obtain public support.
2. Use findings of the evaluation to improve the program.

3. Instruments should be brief and uncomplicated.

4. Should be a continuous process based upon program objectives.

5. Make use of informal evaluations, such as utilization of planning committees.

6. Make use of informal evaluations, such as informal discussions with community leaders.

7. Coordinate with the agricultural education advisory committee.

Conclusions

Based on an analysis of the data presented in the study, it was concluded that:

1. The young farmer teachers who provided the data were qualified by their experience to make valid judgments on all procedures used in the study.

2. The procedures in all five categories for conducting young farmer programs included in the summary constitute a comprehensive list of procedures for conducting young farmer programs.

3. The procedures which were rated the highest in effectiveness in conducting young farmer programs were generally being used by the highest percentage of the teachers.

4. Generally, as agriculture teachers in Virginia gain more experience in teaching young farmers, they tend to rank the procedures used in conducting young farmer programs at a higher rate of effectiveness.

5. No procedures were evaluated as being very effective in conducting the young farmer programs in Virginia. This suggests that many procedures have to be combined or used at the same time to create a very effective young farmer program.

Recommendations

Based on the data secured in the study and the conclusions, the following recommendations were made:

1. The in-service training guide for young farmer programs should be revised to include the procedures which were identified and recommended in this study.

2. The teacher-training and supervisory staffs in Virginia should place more emphasis on the procedures which were identified and recommended in this study as one means of increasing the effectiveness of young farmer programs.

3. The procedures which were rated average and higher in effectiveness and were being used by more than 50% of the teachers, should be used as a guide in conducting the young farmer programs in Virginia.

4. Additional studies should be conducted as follows:

   a) To have the members of the young farmer organizations in Virginia evaluate the effectiveness of the procedures being used in conducting young farmer programs.

   b) Conduct a similar study for the adult farmer phase of the agricultural education program.

   c) Make comparisons to similar studies in other states.

   d) Conduct in-depth studies of each of the five categories in this study.

   e) To determine more adequate procedures for evaluating young farmer programs.

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A STUDY OF ADULT EDUCATION PROGRAMS IN AGRICULTURE

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INTRODUCTION

Traditionally, adult education has been an integral part of the philosophy of vocational agriculture. Originally, vocational education in agriculture was designed to meet the needs of present and prospective farmers. With the expanded definition of vocational agriculture made possible through provisions of the 1963 Vocational Education Act, the purpose of vocational education in agriculture has been to prepare present and prospective farmers, as well as persons in occupations other than farming, who require knowledge and skills in agriculture.

The Regulations of the Connecticut State Board of Education Concerning New Operating Vocational Agriculture Programs (1978) addresses out-of-school youth and adults directly. Section 10-65-3 states:

> Provisions shall be made for the upgrading and retraining of out-of-school youth and adults who are established or about to become established in agriculture or related occupations. On the job supervision shall be an integral part of the adult instructional program.

Although the philosophy of adult education is widely known and accepted and State Regulations provide for adult education as an integral part of the instructional program in vocational agriculture in Connecticut, program leaders detected that the adult education component of the program was not fully developed and implemented. As secondary enrollments in vocational agriculture increased after 1963, emphasis on adult education decreased and adult enrollments declined. With secondary enrollments now declining in some communities, the time seemed right to again focus on meeting the un-met educational and training needs of those adults engaged in farming and related agricultural occupations. A study was needed which would provide an important and up-to-date data base for program development work in adult education in agriculture in Connecticut. The study was conducted to collect and compile data for sound decision making at the State and regional levels.

OBJECTIVES OF THE STUDY

The primary purpose of the study was to collect data about the adult education program in agriculture which could be used to make recommendations for future program planning within Connecticut. More specifically, the objectives of the study were:

1. To determine the background and status of adult education program offerings in agriculture in Connecticut.
2. To identify reasons why adult education programs in agriculture are not offered in some regional vocational agriculture centers within Connecticut.
3. To identify the need for adult education programs in agriculture in Connecticut.
4. To project the number of persons who could use adult education programs in agriculture in Connecticut.
5. To estimate the number of persons who would attend adult vocational agricultural program offerings within Connecticut.
6. To prepare plans and recommendations for the future development of adult education programs in agriculture within Connecticut.

METHOD

The primary methods used to collect the data were the personal interview, a mailed survey, and document analysis. The head teacher in each vocational agriculture center in Connecticut was interviewed regarding the status and need for the adult education program in agriculture. An interview schedule was prepared to guide the interviewer in collecting the data. Data were collected from all eighteen vocational agriculture centers in the State.

Additional data regarding the need for adult education in agriculture and the estimated number of persons who could use and would attend adult education programs in agriculture were collected through a mailed questionnaire. The questionnaire, designed by the researchers, was mailed to a sample of agricultural firm operators and a sample of farmers.

A population of 3862 agricultural firms was identified in the study. From the population of 3862, a random sample of 585 firms was drawn. Six percent, or 20 of the firms were no longer in business, thus the sample size was 565 firms or 14.6 percent. Of the 565 agricultural firms surveyed, 355 responses were received, representing a 63 percent reasponse rate. Of the 355 responses, 320 were usable for analysis purposes.

The current list of Farm Bureau members was used to determine the number of farms in the State. In 1979, there were 2529 Farm Bureau members in the State. The researchers randomly selected 280 Farm Bureau members from the population of 2529. The number represented a 11 percent sample size. From the sample, 180 responses were received, a 64 percent response rate. Of the 180 responses, 132 were usable. Responses from the other 48 Farm Bureau members indicated that, in one form or another, they were not actively engaged in farming. The number represented 26 percent of the responses received.

Following the collection of the data, the researchers analyzed the interview data collected from each head vocational agriculture teacher and compiled and analyzed the questionnaire data collected from the agricultural firm operators and the farmers surveyed. Coupled with information derived through document analysis, the data was reported and recommendations for the future were formulated.

FINDINGS

A summary of results regarding each of the six objectives formulated for the study will be presented here.

Background and status. Seven of the eighteen, or approximately 39 percent of the vocational agriculture programs had adult education courses in agriculture being offered at the time of the study. Several vocational agriculture centers have operated adult programs every year for the past 15 years, while most centers have offered adult courses on an intermittent basis. In centers which did offer adult vocational agriculture, courses were offered primarily for vocational purposes, i.e., for persons directly involved in farming or some aspect of agribusiness. However, a number of courses were offered for non-vocational purposes to meet the needs of interested persons.

Included in the adult education programs offered at the time of the survey were courses in dairy nutrition, farm management, welding, soils and fertilizers, labor management, equipment repair, vegetable gardening, horse management, livestock management, agricultural mechanics, small gas engines, diesel mechanics, pesticides, floral arrangement, landscaping, greenhouse management, and woodlot management.

The major problems identified by department heads of vo-ag programs offering adult education courses were in balancing teaching loads between secondary and adult programs and in scheduling release time for teachers to become involved in field work with adults. Vo-ag programs servicing adults were also faced with the problem of meeting the needs of clientele of different ages, backgrounds, and interest.

Reasons why adult education programs are not offered. Head teachers in vocational agriculture centers not currently operating adult education programs stated that the lack of staff, time, funds and administrative support were the chief reasons for not offering an adult education program. They also identified problems in balancing teaching loads between secondary and adult programs and in scheduling release time for teachers to become involved in field and supervisory work with adults. Several department heads indicated that the teaching load for secondary programs required full-time involvement and little or no time was left for adult education work.

Need for adult education programs in agriculture. All 18 department heads responded "yes" when asked if there was a need for adult education programs in agriculture within their region. The finding regarding the need for adult education in agriculture was consistent with the findings stated in Mannebach and Lownd's (1975) report, Employment Opportunities and Community Resources in Connecticut.

Department heads were then asked to delineate adult education needs. Several department heads indicated that, from time to time, people from agricultural enterprises contact them concerning needed adult education courses. The expressed needs from the public sector, as well as the perceived needs from department heads, include content from all of the curriculum areas offered in vocational agriculture within the State.

Projected number of persons who could use adult education programs in agriculture. Additional information regarding the need for adult education programs was derived from data collected on a mailed questionnaire. The questionnaire was sent to a sample of farmers and agricultural firm operators. Data presented in Table 1 shows the estimated number and percentage of employees who could use agricultural knowledge and skill training or retraining through an adult education program. The total number of employees, full- and part-time, estimated by farm and agricultural firm employers and by respective curriculum areas is also presented.

The total estimated number of farm and agricultural firm full-time employees who could utilize adult education programs was 7,755 which represents 21% of the total population of employees. The total estimated number of part-time employees who could benefit from adult education training for both sets of employers was 3,945, or 28%. Thus, as estimated by both farm and agricultural firm employers, approximately 11,700 employees could utilize adult education training programs in agriculture.

The largest single estimated curriculum group for farms was animal science, which represents 49% and 43% of the total full-time and part-time employees, respectively, who could utilize adult education training. Agricultural firm estimates by curriculum area were evenly distributed with plant science representing 25% and 39% of the full-time and part-time employees, respectively, who could utilize adult education courses. Thus, there would appear to be a large group of full-time and part-time employees who could use agricultural knowledge and skill training in the State of Connecticut.

Estimated number of persons who would attend adult vocational agriculture program offerings. Results of the survey of agricultural firm operators and Farm Bureau members indicated that approximately one-half of those who could utilize or benefit from adult education program offerings in agriculture would actually enroll and attend. Table 2 includes data regarding the estimated number and percentage of employees who would attend an adult vocational program. An estimated total of 1,628 farm employees would attend adult education classes, 871 full-time and 757 part-time. The curriculum area of greatest interest was animal science.

TABLE 1

ESTIMATED NUMBER AND PERCENTAGE OF EMPLOYEES WHO COULD USE AGRICULTURAL KNOWLEDGE AND SKILL TRAINING OR RETRAINING THROUGH AN ADULT EDUCATION PROGRAM BY CURRICULUM AREAS ESTIMATED BY FARM AND AGRICULTURAL FIRM EMPLOYERS

Farm Population Estimate

Employment by Curriculum Area	Total # of Full-time Employees	Full-time Employees Needing Adult Education	Percentage of Total Employees	Total # of Part-time Employees	Part-time Employees Needing Adult Education	Percentage of Total Employees
Ag Mechanics	158	29	18%	57	29	51%
Animal Science	2,715	1,343	49%	1,943	829	43%
Plant Science	2,158	429	20%	2,744	715	26%
Natural Resources	972	43	4%	557	71	13%
Subtotal	6,003	1,844	31%	5,301	1,644	31%
Agricultural Firm Population Estimate						
Ag Mechanics	1,834	356	19%	433	56	13%
Animal Science	10,521	1,111	11%	4,578	511	11%
Plant Science	16,377	4,133	25%	4,044	1,578	35%
Natural Resources	1,600	311	19%	389	156	40%
Subtotal	30,332	5,911	19%	9,444	2,301	24%
GRAND TOTALS	36,335	7,755	21%	14,745	3,945	28%

TABLE 2

ESTIMATED NUMBER AND PERCENTAGE OF EMPLOYEES WHO WOULD ATTEND ADULT VOCATIONAL AGRICULTURE PROGRAMS TO DEVELOP AND/OR UPDATE THEIR AGRICULTURAL KNOWLEDGE AND SKILLS WITHIN CURRICULUM AREAS ESTIMATED BY FARM AND AGRICULTURAL FIRM EMPLOYERS

Employment by Curriculum Areas	Total # of Full-time Employees	Full-time Employees Who Would Attend	Percentage of Total Employees	Total # of Part-time Employees	Part-time Employees Who Would Attend	Percentage of Total Employees
Farm Population Estimate						
Ag Mechanics	158	14	9%	57	14	25%
Animal Science	2,715	643	24%	1,943	443	23%
Plant Science	2,158	171	8%	2,744	214	8%
Natural Resources	972	43	4%	557	86	15%
Subtotal	6,003	871	15%	5,301	757	14%
Agricultural Firm Population Estimate						
Ag Mechanics	1,834	178	10%	433	44	10%
Animal Science	10,521	633	6%	4,578	333	7%
Plant Science	16,377	1,955	12%	4,044	789	20%
Natural Resource	1,600	233	15%	385	100	26%
Subtotal	30,332	2,999	10%	9,444	1,266	13%
GRAND TOTAL	36,335	3,870	10%	14,745	2,023	13%

An estimated total of 4,265 agricultural firm employees would att[illegible] adult education classes. Estimates projected from agricultural firm employers' responses were that 2,999 full-time and 1,266 part-time employees would attend adult education classes. The major curriculum area in which instruction was needed was plant science.

As can be seen by the data presented in Table 2, the employers' estimates of employees (full-time and part-time) who could use agricultural knowledge and skill training is higher than employers' estimates of those who would attend an adult education course, Table 1. The employers' estimates of those who would attend for both farm and agricultural firm categories is 3,870, or 10% of the full-time total population estimate, and 2,023, or 13% of the part-time total population estimate. Within both questions of estimate of those who need agricultural knowledge and skills and those who would attend for the agricultural firm category, the number of part-time employees is estimated to be higher than full-time employees for those who could utilize and would attend an adult vo-ag program. This may be indicative of the lack of skills and the need to upgrade knowledge and skills of part-time help who more than likely have less agricultural background than full-time employees.

Plans and recommendations. The results of the study were derived from department head interviews, surveys of farm and agricultural firm employers, and document analysis. Three basic strategies regarding adult education in agriculture were prepared to help meet the educational and socio-economic challenges of the 80's and to increase the educational opportunity for all potential enrollees. A maintenance strategy was recommended for three regional vocational agriculture centers which have consistently offered quality adult education programs. Two of the three centers currently have a full-time adult education teacher employed. Having a full-time adult teacher is a pattern which was recommended for all centers to achieve.

A second strategy was to expand present adult education offerings. The expansion strategy was recommended for five centers which currently offer minimum adult education courses. The recommendation was made based on the finding that there is a growing need to meet the manpower training needs of Connecticut's agricultural enterprises.

A third strategy was to develop new programs of adult education. The recommendation regarding a new program strategy pertained to ten regional vocational agriculture centers.

In summary, it was recommended that every vocational agriculture program should operate an adult education program. Courses which reflect the agricultural needs of the region should be offered. Every vocational agriculture center in the State should employ a full-time adult education teacher or coordinator to implement the adult education program in agriculture, act as a community resource person, work with FFA alumni, and coordinate recruitment and placement efforts for both secondary and adult vocational agriculture programs.

DISCUSSION

The data presented previously indicate that adult education is an important and vitally needed component of the program of vocational agriculture. A major effort is needed to re-emphasize its importance and to establish adult education again as a more integral part of the vocational agriculture program in Connecticut.

Evidence collected indicated that the majority of the vocational agriculture centers in Connecticut were not offering adult education courses at the time of the study. Others offer courses on an intermittent basis and operate a minimum program. The reasons given regarding why more adult education courses and programs were not offered included lack of staff, time, money and administrative support.

Two or three programs seem to be exemplary within the State, namely because they have a full-time person assigned to adult education. Even in those situations, all of the adult agricultural education needs within the region are not being met.

All vocational agriculture department heads interviewed agreed that there was a need for an adult education program within the regional vocational agriculture center. This finding was confirmed by responses from farm and agricultural firm employers. A projected total of 7,755 full-time employees was estimated to be able to use agricultural knowledge and skill training or retraining through an adult education program; 1,844 farm employees and 5,911 agricultural firm employees. An estimated total of 3,945 part-time employees; 1,644 farm employees and 2,301 agricultural firm employees was projected to be able to use adult education and training in agriculture. With 19 vocational agriculture centers currently operating in Connecticut, the theoretical average number of persons who could benefit from adult education programs was approximately 615 potential adult enrollees per center. It appears that the clientele is present; the role of the adult educator is to identify the unmet educational and training needs of the potential clientele and offer relevant programs to meet the needs.

It was estimated that a total of 5,893 farm and agricultural firm employees would attend adult vocational agriculture programs to develop and/or upgrade agricultural knowledge and skills. Theoretically, the average number of persons who would attend adult education programs in each center is approximately 310. While the total number of potential people would not be enrolled at one time, the potential enrollment certainly seems to be present. The major curriculum area in which instruction is needed is animal science for farmers and plant science for agricultural firm workers.

The data collected indicated which regions should maintain, expand or develop new adult education thrusts in agriculture. The data suggested that three centers should maintain programs, five centers should expand their existing program and ten centers should develop new programs.

It is evident that new initiatives in adult agricultural education must take place. As the nation enters the information age, every effort must be made to develop and maintain an educated and well trained agricultural labor force. New patterns of delivery must be developed. A redefinition of the role of adult education in agriculture must be made. A comprehensive analysis of course content and research regarding how the course content can be delivered most effectively is needed. New ways of funding adult education must be sought. A definition of what constitutes a full-time load for adult education instructors is needed.

It is evident that there is a large clientele of adults who need and/or would attend adult vocational agriculture courses. A large gap exists between the manpower needs of agricultural enterprises and the response by Connecticut's vocational agriculture program. Program leaders and others concerned with the future of agriculture in Connecticut must continue to address the problem.

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A DISCUSSION OF RESEARCH REPORTS PRESENTED ON TEACHER EDUCATION AND ITS PROGRAMS*

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Discussants at research conferences are presented with quite a challenge. We are asked to review manuscripts and to analyze the strengths and weaknesses of the research reported without the benefit of interaction with the researchers. We are asked to be constructively critical without being harsh. I submit to you that no one enjoys criticism, however constructive or tactful it may be.

I am convinced, though, that this aspect of our conference is absolutely essential for the improvement of research. Having my own research critiqued in the past has made me a better researcher. Listening to and reading the critiques of other discussants has made me a better researcher. Therefore, when asked to assume the role of a discussant at this conference, I readily accepted, not because I enjoy critiquing others, but because I know it is good for our profession and for my own professional development. It is within this context that I approached my assignment.

Report I

AN OCCUPATIONAL MARKET ANALYSIS OF VOCATIONAL AGRICULTURE TEACHER EDUCATION POSITIONS

Strengths

I commend the authors for addressing a research area that needs our attention. Perhaps others of us have shied away from conducting research of this type due to the obvious difficulties involved with attempting to analyze the future job market.

The manuscript was well organized, easy to follow and generally well written with the exception of a few errors that were in the draft copy I reviewed, which I'm sure have been corrected in the final copy. The introduction to the paper presents a clear statement of the problem, the need for the study, and an adequate review of relevant literature. The procedures used were clearly stated. The tables used in presenting the data were clear and adequately explained in the text, and appropriate conclusions were drawn. Too, I commend the researchers for raising cautions for the reader related to the instrumentation used in the study.

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*A discussion paper presented at the Tenth Annual National Agricultural Education Research Meeting, Anaheim, California, December 2, 1983.

Suggestions for Improvement

Further explanation is needed regarding the validation of the instrument. It was stated that the draft survey form was submitted to a panel of teacher educators for critique and validation, but no mention was made as to who these persons were and how many were involved. The revised instrument was then field tested on the faculty at Virginia Tech. I assume this meant the faculty in Agricultural Education at Virginia Tech, but this point was not made clear.

It would be helpful if the information presented in the text on tenure was also displayed in a table, especially since it relates to one of the objectives of the study. At the same time, the information on enrollment and the accompanying table could be omitted since it did not relate to any of your stated objectives. In fact, if it were not relevant to the objectives, why even collect such data?

As you stated, the enrollment data are difficult to interpret. With the procedure used of not coding the questionnaires in order to assure anonymity, how does one handle the problem of respondents from the same institution reporting different figures, or the possibility of double responses from the same persons? I know for a fact that the enrollment figures I reported were somewhat different from those reported by my colleagues at Texas A&M. Did the researchers consider asking only the head teacher educators to respond to that part of the questionnaire, just as was done with the section dealing with projections of the number of doctoral graduates over the next three years?

There are also some problems related to the projections of doctoral graduates expected to seek teacher education positions over the next three years. Since only 30 of 96 head teacher educators reported this information, the total picture remains fuzzy. This could mean that the 66 who did not provide this information did not have a doctoral program, or it could mean that they just didn't respond. There could also have been some confusion in interpreting the directions in the questionnaire. The directions call for only "department heads" to respond to that section. There are a good many "head teacher educators" who are not "department heads," and thus may not have responded for that reason.

While the researchers did a commendable job of developing recommendations based on the findings and conclusions, I would also like to see some recommendations for further study. After the experience of conducting this research, what suggestions might be offered for related research efforts?

Report II

DEVELOPING AND MAINTAINING PRODUCTIVE RESEARCHERS IN AGRICULTURAL EDUCATION

Strengths

There are many strong points in this research. The manuscript was well organized and written in plain straightforward language. The research problem is clearly one of concern to agricultural educators, and certainly adds a needed dimension to our research efforts. The research design was clearly formulated and appropriate for the study. Defendable, logical criteria were used in selecting the universities to be included in the study. The researchers are to be commended for conducting on-site interviews to collect the data. This was a refreshing departure from the more typical data collection procedures, and adds a great deal of credibility to the study. I also like the methods used to identify high and low research producers.

The introduction is effective in presenting the problem and in raising a number of relevant research questions, which flow smoothly into the statement of objectives. The researchers did a good job of portraying the profiles of the high and low research producers and of describing the factors perceived by agricultural education faculty members as enablers and inhibitors of research productivity. Too, the conclusions are clearly stated and substantiated by the findings.

Suggestions for Improvement

While the introduction to the paper presents the problem clearly and concisely, it would be strengthened by a selected review of literature to establish the need for the study. Evidence of significance and relevance should be presented.

Objectives one and three were accomplished in the study, but objective two, "to determine if there were differences among these researchers by vocational service area, career stage, or sex," was not addressed adequately. Little information was provided to describe the differences between the research productivity of faculty members in the different service areas, and no information was given relative to differences among male and female faculty members. Likewise, objective four, "to derive implications for graduate education and faculty development programs to facilitate research productivity," was not really addressed. While the reader can derive his/her own implications, I would think the researchers ought to do this if it was stated as an objective.

A bit more information about the interview process would be helpful. Were all interviews conducted by the same person? Over what period of time were the interviews conducted? Approximately how much time did each interview take? What techniques were used in arranging the interviews? How was the interview checklist developed? Such information might be helpful to other researchers who might wish to conduct a similar study in the future.

How were the eleven variables that were speculated to contribute to research productivity determined? In identifying the indicators to be used to quantify research productivity, it was mentioned that eight indicators were "highly intercorrelated." What is meant by "high"? Was there a minimum correlation coefficient used? The intercorrelations can be used to determine internal consistency (reliability) of the research productivity score. But how was the validity of this score established?

In my opinion, the "Results" section was the weakest part of the paper. It would be helpful if the tables appeared in proximity to the text to facilitate ease of referral rather than at the end of the paper. Also, some significant information was omitted from Table 1. The number and percent of high producers and low producers by service area should be shown, and nothing is shown to reveal differences between males and females.

In reporting the findings for agricultural education, a good bit of extraneous background information was presented. While interesting, it had little to do with the objective "to describe the factors perceived by agricultural education faculty members as enablers and inhibitors of research productivity."

Throughout the paper, I searched for some treatment of the commonly held belief that teaching load is a negative correlate of research productivity. Was teaching load examined to determine its relationship to research productivity?

Finally, I would like to see the researchers identify some recommendations for further study. Let me raise some questions from the findings that might deserve further study. The findings revealed that most faculty members in the high producers group were classified in the general area of vocational-technical education rather than in the traditional service areas. Is the climate in such settings more conductive to high research productivity? Does the category of doctoral program, i.e., general vocational-education doctoral program vs. service area doctoral program, contribute to research productivity? Also, if there are so many low producers in agricultural education (60%) in the six universities studied (which are, by the measures used, the stronger research universities in the country), what does this say about the research productivity in agricultural education nationwide?

Report III

A NATIONAL ASSESSMENT OF AGRICULTURAL EDUCATION STUDENT ORGANIZATIONS

Strengths

The authors are to be commended for tackling a research problem that heretofore has not had a great deal of attention by researchers in agricultural education. I consider the study of student organizations to be significant to our profession and to be worthy of further research. The researchers have contributed knowledge to an area that deserves our attention.

I like the way the methods for conducting the study were described in a succinct, systematic, straightforward manner. Likewise, the major findings of the study were summarized and presented clearly and concisely. I also appreciate the logic used in drawing conclusions based on the findings for each objective. This made the study easy to follow.

Another commendable feature of the study was the high rate of return (86.4%) of the instruments. Well designed, systematic follow-up measures were used to secure this excellent return rate.

Suggestions for Improvement

While many may believe this to be a significant and relevant study, such evidence is sorely lacking in the introduction. While I realize there are space limitations in writing a paper like this, it would have been strengthened greatly by establishing a theoretical base and by presenting a review of related literature, especially to establish the need for this particular study. Likewise, there was no substantiation from the literature for this statement in the introduction: "Identification of how student organizations are being used and how individuals perceive their use is important to insure the effectiveness and usefulness of faculty time spent working with the organizations." I also question whether the greatest value of the study was to "insure the effectiveness and usefulness of faculty time spent working with the organizations." What about all the time and energy being devoted by the students? Shouldn't we be concerned about insuring the effectiveness and usefulness of their time also?

The objectives of the study were stated clearly, and were capable of being answered. It would have been possible, however, to shorten the number of objectives by combining those that were closely related.

Regarding the procedures, I would like to see a rationale given for the selection of officers and advisors for the population. Does limiting the responses to these two groups inject an obvious bias? Might the responses of the general membership differ from those of the officers? I think also that the methods used to establish the items to include in the questionnaire were rather limiting. In addition to the use of student officers and advisors at Virginia Tech to generate an item pool, should there not have been a review of literature and perhaps a review of the statements on objectives and purposes from organizations in other universities? Also, should not persons have been used in the validation process from outside the Agricultural Education Department at Virginia Tech? Likewise, there was no mention of a pilot test of the instrument to strengthen its validity. Seven activity categories and an aggregate score were derived from the 23 individual items. Evidence is needed to support the pooling of items, e.g., measures of internal consistency.

I feel duty bound to call attention to one other methodological concern, and that has to do with the appropriateness of the statistical procedures used to analyze some of the data. Why were inferential statistics used when the total population was surveyed, and random sampling was not employed? To what population can you infer? Enough said, except to chide the researchers for violating the very research principles so ably espoused by their colleagues at VPI (Oliver and Hinkle) in a number of papers presented at research conferences over the last several years.

While the tables to display the data were generally clear and explained adequately, I would like to caution the writers against presenting material in the text that can not be found in the related table. For example, it was mentioned in the discussion of Table 1 that overall, 70% of the student officer respondents were male and 30% were female and of the advisors, 96% were male and 4% were female. In the table, however, officers and advisors were grouped together. The same thing happened in Table 3 when presenting the data related to support of competition.

I have already commented on the inappropriateness of using inferential statistics, but since they were used, I want to make a suggestion regarding displaying the data in Tables 6 and 7 which compared the mean perceptions of respondents. Even though the discussion of the results of the Sheffé test revealed where the significant differences were among the four groups, the tables did not. It would be helpful to show such significance by assigning letters to each group and indicating something like $d > a,c$.

One last thing - this study, like most others, raises as many questions as it answers. I would like to see a section devoted to recommendations for further research and for how the results of the study can be used.

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VIRGINIA
TECH

AN OCCUPATIONAL MARKET ANALYSIS OF AGRICULTURAL EDUCATION TEACHER EDUCATION POSITIONS

AGRICULTURAL EDUCATION

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AN OCCUPATIONAL MARKET ANALYSIS OF AGRICULTURAL EDUCATION TEACHER EDUCATION POSITIONS

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INTRODUCTION

Occupational opportunities in teacher education are a foremost concern in the minds of aspiring teacher education doctoral students as well as current university faculty. Scully (1983) attributes this concern to what Mortimer calls the three R's of the 1980's: reallocation, reduction, and retrenchment. Mortimer's study estimates that of the 490,000 college teaching faculty in the United States, 43% are tenured (in Scully, 1983). One cannot equate being tenured with job security in the 1980's as 1200 of the 4000 faculty dismissed from higher education positions in this country in the past five years had been tenured, (Mortimer in Scully, 1983). It appears that the higher education job market is being affected by tenure decisions and dwindling financial resources. In terms of faculty numbers in higher education for 1982, a survey reported in The Chronicle of Higher Education indicates that 29.5% of all institutions had increased faculty numbers, 14.6% had decreased, and 55.9% had remained stable in size over the year (August, 1983).

Masland and Williams (1983) discuss the fate of teacher education in terms of undergraduate enrollment. They report that in the past ten years, education degrees awarded have dropped from 176,614 in 1971 to 108,309 in 1981. The number of projected graduates in education will meet only 80.5% of the projected additional teachers needed by 1988 (Projections, 1980). Akins (1983) reports in a study of the supply and demand for teachers that education in general is in for severe teacher shortages nationwide in a number of fields. He reports, as does Craig (1983), that vocational agriculture has experienced shortages of teachers for at least ten years, and that the shortages are expected to continue. The fate of teacher education positions appears to be in question even though there are predicted shortages of trained teachers.

Are the national trends in higher education affecting agricultural teacher education programs? There is limited data to answer that question. There is a need to know what the job market looks like in terms of teacher education positions over the foreseeable future. The profession needs to be aware of its personnel needs. This study is an attempt to provide at least part of the data to address those concerns.

OBJECTIVES

The purpose of this study was to examine the occupational market for agricultural teacher education over the immediate future. The specific objectives were to determine:

1. the status of members of the profession in terms of the tenure system,
2. the number of planned job moves over the next five years by agricultural teacher educators,

3. the reasons for any planned departures from current positions,
4. anticipated effects of Reuction In Force (RIF) on the profession over the next five years,
5. the number of projected doctoral graduates in agricultural education who will probably seek teacher education positions over the next three years.

METHODS

Instrumentation

A somewhat similar study in home economics education, (Moore, 1976) was found useful in providing several items of interest in the current study. The literature review also provided several concerns of members of the profession which related to the overall purpose of this study. Unfortunately, no appropriate instrument was found to address the specific concerns of the study. Accordingly, the researchers developed a list of questions which addressed the objectives of the study and to which answers would be sought. The questions were then worded as survey items. The draft survey form was submitted to a panel of teacher educators for critique and validation. Their suggestions resulted in several changes and the resulting instrument was field tested on the faculty at Virginia Tech. They found no problems with the instrument as used, so the second draft was not revised further for the major mailing. The final instrument appears as Appendix A.

Because it is not a summated type survey, statistical reliability estimates are inappropriate. Obviously, the prediction of the future is inherently difficult and job market projections are always somewhat unreliable. Thus, the reliability of the instrument must be assumed to be the same as the respondents' reliability in self-reporting of plans. The reader should keep this limitation in mind when interpreting the results of this study.

Data Collection

The population for the study was all teacher education faculty members at recognized agricultural education programs in the United States. The total number of such faculty is fairly small and the turnover rate has traditionally been small each year. For those reasons, a population survey was used rather than a sample. The population was further defined as being all of the teacher education faculty listed in the Agriculture Teachers Directory, 1983 edition. A number of corrections were made to this list based on the personal knowledge of the Virginia Tech teacher education faculty. The final mailing list consisted of 329 persons in 96 institutions. Of the 329 in this mailing, 7 returned their questionnaires indicating that they were not teacher education faculty members. Thus the actual N for the study becomes 322.

The first mailing was conducted in late September to insure that all of the institutions had started school for the year. Because of the personal and potentially delicate nature of the survey, the cover letter promised complete anonymity and indicated that the questionnaires were not coded, (Appendix B). Thus the follow-up at the end of two weeks had to be sent to all of the persons in the initial mailing. The cover letter thanked those who had responded, asked the remainder to respond, and explained that we had no way of knowing one group from the other, (Appendix C). After about six weeks, there were 234 usable responses, for a return rate of 73%. Follow-up of non-respondents was not possible, because they could not be identified. All of the data reported in the remainder of this paper are limited to the 234 respondents because the feasibility of generalizing the findings to the non-respondents could not be estimated.

RESULTS

Findings

Because the number of projected departures was small, the decision was made to use all responses that were reasonably complete, even though a number of the responses had missing data. As a result, there are minor discrepancies among several of the cross-tabulations that follow in terms of *N*.

Of the 234 teacher educators who responded to the job market survey, 31 were from the Eastern region of AATEA. From the Southern region there were 70, from the Eastern region 79, and from the Western region 53. One respondent failed to list a region. There were 181 respondents from land-grant universities and colleges, with 51 from state universities and colleges, 1 from a private college, and 1 respondent failed to indicate type of school, see Table 1. The age of the respondents ranged from 27 to 66 with a mean of 44.9 years. There were 229 males, 3 females, and 2 who did not indicate sex. In response to the question on academic rank, 10 reported that they were instructors, 61 assistant professors, 61 associate professors, 94 professions, and 8 reported other classifications. A total of 209 (90%) indicated that they were in tenure track positions while 24 (10%) reported being on non-tenure tracks. Of the tenure track individuals, 154 already have tenure. Of the remaining 55, when asked when they intended to apply for tenure, 5 indicated that they were being considered in 1983, 17 in 1984, 15 in 1985, 7 in 1986, 7 in 1987, 2 in 1988, and 2 in 1989.

Table 1
Responses by AATEA Region and Type of Institution

	Type of Institution			
Region	Land Grant	State	Private	Total
Eastern	31	0	0	31
Southern	55	14	1	70
Central	63	16	0	79
Western	32	21	0	53
Total	181	51	1	233

To estimate the sizes of the programs of agricultural education, the survey asked for undergraduate and graduate enrollments. A problem arises when one attempts to interpret this data, because the results are skewed heavily in favor of the larger schools. As an attempt to overcome this problem, enrollment means, medians, and modes will be reported, (see Table 2.) The mean enrollments for undergraduates was 89.1. The median was 70.1 and the mode was 40. At the masters level the mean was 36.5, the median was 25.0 and the mode was 30 students per department. At the specialist or advanced certificate level, the mean enrollment was 15.7, the median was 8.5, and the mode was 2 students. An examination of the extreme ranges (0 to 600 for undergraduates) probably implies a misunderstanding on the part of at least one respondent. Thus the median may well be a better estimate of the typical size of the agricultural education departments in this case than is the mean.

Table 2
Enrollments in Agricultural Education by Level

Level	Mean	Median	Mode	Minimum	Maximum
Undergraduate	89.1	70.1	40	0	600
Masters	36.5	25.4	30	1	200
Specialist/Advanced	15.8	8.5	2	0	120

When asked for their occupational plans for the next five years, 181 of the respondents indicated that they intended to remain in their current position. Another 46 plan to leave their current positions for a variety of reasons, mostly retirement. The remaining 7 either failed to respond to the question or wrote in "don't know," which was not one of the options. When asked for their reasons for leaving, 48 responded, see Table 3. The most frequently cited reason (N=24) was retirement, followed by moving to another institution but staying in agricultural education (N=8). If one assumes that all of those moving to other institutions were moving into positions being vacated by persons included under other categories, the actual number of net vacancies could be as low as 40. However, that is speculation, and for the remainder of this paper, that possibility will not be taken into account.

There has been much discussion in the literature over the past several years about reductions in force (RIF) at American colleges and universities. One objective of this study was to determine the extent to which RIF problems were affecting the agricultural teacher education profession today. One respondent indicated that his or her imminent departure from the current position was as the result of a RIF. Even one job lost is important. Certainly no one would try to tell the one RIF victim that RIF was not a problem. But, in light of the level of expressed concerns, the projected loss of just one position over the next five years, out of 234, is not as severe a problem as had been thought.

Those indicating plans to move were asked to specify the year; however, only 34 of the respondents were able to do so. Those giving a year for their planned departure from their current positions were 2 in 1983, 16 in 1984, 7 in 1985, 3 in 1986, 4 in 1987, and 2 in 1988. Practically all of those leaving felt that their positions would be filled (N=44).

Table 3
Reasons Cited for Leaving Current Position During Next Five Years

Retirement	24
Moving to Another Institution, Stay in Ag. Ed.	8
Moving to Another Institution, Out of Ag. Ed.	4
Leaving Higher Education	2
Position Discontinued, Reduction in Force	1
Other	9
Total	48

An examination of Table 4 reveals that the Southern Region can expect the most job openings over the next five years (N=17), followed by the Central region with 13, the Western region with 8 and the Eastern region with 7. Of the total openings, 37 will be in land grant colleges or universities, 8 will be in non-land grant schools. Full professors make up the largest portion (18) of the planned departures. Assistant professors follow with 12 planned departures, then associate professors with 8 and instructors with 5.

Table 4
Projected Departures by Type of Institution, AATEA Region, and Rank

Region	type	Instr.	Asst. Prof.	Assoc. Prof.	Prof.	Other	Total
Eastern	Land Grant	1	0	2	4	0	7
	Other	0	0	0	0	0	0
Southern	Land Grant	2	5	1	4	1	13
	Other	9	1	2	1	0	4
Central	Land Grant	1	4	1	5	1	12
	Other	0	1	0	0	0	1
Western	Land Grant	0	1	1	3	0	5
	Other	1	0	1	1	0	3
Total	Land Grant	4	10	5	16	2	37
	Other	1	2	3	2	0	8
	TOTAL	5	12	8	18	2	45

The final objective of the study was to project the number of doctoral graduates who could be expected to seek teacher education positions over the next three years. To avoid duplication of numbers, only head teacher educators were asked to report on expected doctoral graduates. An examination of Table 5 reveals that the projected number of such graduates for 1984 ranges from 0 in the western region to 20 in the southern region. For the next year, the central region should produce the highest number, at 26. For the entire three year period, the central region head teacher educators reported an anticipated 69. They were followed by a projected 61 for the southern region, 17 from the eastern region, and 7 from the western region. The number of head teacher educators reporting projected doctoral graduates for 1984 was 26. The number of those reporting projected doctoral graduates rose to 30 in 1985 and again in 1986. The number of responding head teacher educators who projected doctoral graduates by year ranged from 0 in the western region in 1984 to 15 in the central region in both 1985 and 1986.

Table 5
Projected Doctoral Graduates Who Are Expected To Seek Teacher Education Positions

Region	Year 1984	1985	1986	Total	No. of Institutions*
Eastern	4	4	6	17	3, 4, 3
Southern	20	19	22	61	10, 15, 15
Central	19	26	24	69	13, 15, 15
Western	0	4	3	7	0, 3, 2
Total	43	56	55	154	26, 30, 30

*numbers of institutions in region reporting projected doctoral graduates in 1984, 1985, and 1986, respectively.

Conclusions

The findings of this study must be interpreted in light of the difficulty in projecting the future. Individuals' plans are frequently fragile and may respond to changing circumstances. Additionally, not all members of the profession responded to the survey. However, in light of the findings of this study, a number of conclusions can be made.

1. The profession is heavily tenured. Of the 234 respondents, over half (154) already have achieved tenure. Another 55 are in tenure track positions.
2. The profession is heavily weighted toward the upper end of the rank structure. we have more full professors than associates, and more associates than assistants.
3. The profession can expect approximately a 4% turnover during each of the next five years from planned position changes. This does not consider unplanned moves or deaths. Certainly there will be additional position vacancies that could not be projected by this study. There are; however, at least 48 members of the profession who plan to leave their present positions during that time.
4. Fully half of the projected position vacancies will result from retirements, that is triple the number resulting from any other reason.
5. The southern region of AATEA can expect the most position vacancies over the next five years. The central region is a close second, with the western and eastern regions offering considerably fewer opportunities for new graduates.
6. The vast majority of openings will be in the land grant schools.
7. The central region has more doctoral programs and will produce more doctoral graduates than any other region over the next three years. The southern region is close behind in both areas and in fact should

produce the highest number of new doctorates in 1984 only. The eastern region is a distant third on both counts, with the western region having the fewest programs and projected graduates.

8. Reduction In Force (RIF) problems are not a major national concern in agricultural education -- at least not at this time.
9. The number of doctoral graduates seeking teacher education positions can be expected to exceed the number of job openings by a factor of nearly three to one in 1984, the most favorable year between now and 1986. That ratio can be expected to worsen in 1985 and 1986. Prospects are not bright for aspiring members of the profession today, and we cannot project any improvement by 1986.
10. Even in the western region, the number of projected graduates who will seek teacher education positions exceeds the number of projected openings for the forseeable future. The imbalance becomes much more severe in the southern and central regions.

Recommendations

Based on the findings and conclusions, the following recommendations are offered for the profession:

1. Prospective doctoral students should be made aware that the job market in teacher education is not and probably will not become very favorable for them, at least not in the forseeable future.
2. Institutions planning to begin or expand doctoral programs should carefully consider the ethics of recruiting doctoral students for programs that probably will not lead to teacher education positions for the majority of them.
3. Agricultural education doctoral programs should recognize the limited market for their doctoral graduates inside the profession and gear their programs toward better preparation of their students for administrative and industry positions.
4. A logical step would be to strengthen cognate requirements to give the graduate other skills and experiences than strictly teacher education.
5. Internships could be directed more toward agricultural industry training experiences.
6. It is the responsibility of the profession to maintain the highest standards in its new members. To that end, the excessive numbers of doctoral graduates is good, in that it provides multiple applicants for each position announcement. That allows for selection of the most qualified graduates to enter the profession.
7. At the same time, it is the responsibility of graduate advisors to let their potential doctoral students know in advance what the job market is like in teacher education. Having been thus advised, the doctoral student must be willing to accept the potential disappointment. The final decision is the student's to make.

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Appendix A

An Occupational Market Analysis of Vocational Agricultural Teacher Education Positions

Part I: Demographic Information

1. In which AATEA region is your institution located:

_____Eastern _____Southern _____Central _____Western

2. In which type of institution does your program exist?

a. ____ land grant college or university
b. ____ state university (not land grant)
c. ____ city college or university
d. ____ private, church related
e. ____ private, not church, related
f. ____ other (specify) ______________________________________

3. How many Agricultural Education faculty members are in your program/department.

____ (Number full time) ____ (Number part time)

4. What is your institution's current total student population?

_____________ (Number of students)

5. What is your department's current undergraduate enrollment in Agricultural Education? ______________ (Number of students)

6. What is your department's current graduate enrollment in Agricultural Educ.?

___________ (Masters) ________ (Ed.Spec./CAGS) _________ (Doctoral)

7. Is your department administered under a college of agriculture, college of education, or other provision? (specify)___________________________________

8. Does your department share appointments with any other department, school or college? ___________ yes ___________ No
(Please specify department, school or college, if yes)____________________

Part II: Personal Data & Occupational Status

9. What is your age and sex? ______age(Number of years) _____Male _____Female

10. What is your present academic rank?

a. ____ Instructor
b. ____ Assistant Professor
c. ____ Associate Professor
d. ____ Professor
e. Other (specify) ________________________________

11. Is this position full time or part time? ____full time ____part time

12. Is your present position in a tenure track? ____yes ____no

13. If yes to #12, are you tenured? ____ yes ____no

14. If #13 is no, what year do you expect to apply for tenure? ___________

(PLEASE CONTINUE)

Part III: Future Occupational Plans

15. Do you plan to remain in your present academic position for at least the next 5 years? ____yes ____no
If yes to #15, thank you for your cooperation and department heads see Part IV.) If no, please continue.

16. What is the reason for your planned occupational change?
    a. ____ retirement
    b. ____ moving to another institution but staying in Ag Education
    c. ____ moving to another institution and out of Ag Education
    d. ____ leaving higher education altogether
    e. ____ other (specify) ______________________________

17. What month and year do you plan to leave your current position?
__________Month __________ Year

18. Do you expect your position to be filled after you leave it?
______ yes ______ no

19. If #18, is No, why not? ______________________________
____

Part IV: Department Heads Only, please respond

20. How many doctoral students from your department do you expect to graduate during the following academic years?
    a. ________ (number) 1983-1984
    b. ________ (number) 1984-1985
    c. ________ (number) 1985-1986

21. Of those, how many graduates do you expect will seek a teacher education position in agricultural education at colleges or universities in the U.S.?
    a. ________ (number) 1983-1984
    b. ________ (number) 1984-1985
    c. ________ (number) 1985-1986

22. How many of your doctoral graduates, in your opinion, will probably seek positions as:

	1983-84	1984-85	1985-86	
a.	______	______	______	teacher educators
b.	______	______	______	teachers at community, technical or junior colleges
c.	______	______	______	teachers (kindergarten-12)
d.	______	______	______	administrators and supervisors at the college or university level
e.	______	______	______	administrators and supervisors at the community, technical or junior college level
f.	______	______	______	administrators and supervisors at the secondary school level
g.	______	______	______	full time researchers
h.	______	______	______	employees in state departments of education
i.	______	______	______	teachers/administrators in foreign countries
j.	______	______	______	other (specify)__________________

(PLEASE CONTINUE)

23. In view of your agricultural education department's present situation, what do you anticipate will occur over the next 5 years? (consider retirements, staff movement, etc.) (PLEASE MARK PARTS a & b)

a. The number of permanent Ag Ed faculty will
_____ increase, _____ decrease, _____ remain the same

b. The number of temporary Ag Ed faculty will
_____ increase, _____ decrease, _____ remain the same

You have our pledge that this instrument is not coded and that no attempt will be made to identify individuals or institutions in any way. Your complete anonymity is assured. We wish only to compile job market projections for our profession. Thank you for your assistance.

Barbara J. Malpiedi
William G. Camp
Agricultural Education
Virginia Tech
Blacksburg, VA 24061

Appendix B

COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

September 30, 1983

Dear Fellow Teacher Educator:

The occupational outlook for agricultural teacher education is often a topic of discussion for our profession. In view of the changing financial situations in all of our institutions, and the concerns of potential teacher education doctoral students, we are attempting to compile job market projections for our profession. To do this, we need your response to the enclosed survey.

The instrument is not coded and you have our pledge that there will be no attempt to identify either individuals or institutions. Data will be reported only as means, so your anonymity is assured. So that we may report current findings at this year's AVA convention, please complete and return the enclosed questionnaire by October 14.

Thank you for your assistance as we realize the sensitive nature of the data. We hope, however, that through your cooperation, an informative summary of agricultural teacher education opportunities will result.

Sincerely,

Barbara J Malpiedi

Barbara J. Malpiedi
Instructor
Agricultural Education

William G Camp

William G. Camp
Assistant Professor
Agricultural Education

/ds

Enclosure

Appendix C

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION Blacksburg, VA 24061

October 17, 1983

Dear Fellow Teacher Educator:

Two weeks ago we mailed you a questionnaire entitled "An Occupational Market Analysis of Vocational Agricultural Teacher Education Positions". At that time, we also promised complete anonymity. For this reason, we are mailing everyone a second questionnaire as part of the follow-up procedure.

The return rate has been very good. Thank you if you have already completed and returned the questionnaire. If not, please complete the enclosed questionnaire and return it before October 28. The results will be presented at this year's National Agricultural Education Research Meeting at AVA.

Barbara J. Malpiedi
William G. Camp
Agricultural Education

DEVELOPING AND MAINTAINING
PRODUCTIVE RESEARCHERS IN AGRICULTURAL EDUCATION

Maureen E. Kelly
Assistant Professor, Home Economics Education
University of Wisconsin-Madison

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Professor and Department Chair, Agricultural Education
The Ohio State University

Presented at the
Tenth Annual National Agricultural Education Research Meeting
Anaheim, California
December 2, 1983

INTRODUCTION

Teaching, research, and service describe the threefold mission of the land grant university. Most faculty members in agricultural education employed in land grant universities subscribe to the proposition that all three dimensions of this mission are as important to agricultural education as they are to other areas of academic endeavor.

This paper is concerned with the research function of the teaching-research-service mission. How productive are agricultural education faculty members in generating new knowledge? How does the research productivity of faculty members in agricultural education compare with faculty members in other vocational education service areas? What factors encourage and enhance the research productivity of agricultural educators? What factors inhibit research productivity? What can be done to increase research productivity in agricultural education?

To address these questions we use Kelly's (1982) dissertation research in which she investigated research productivity of faculty members in vocational education. A major part of the paper reports the results of indepth interviews with 27 faculty members in agricultural education who were participants in the research reported in the dissertation.

OBJECTIVES

The objectives of the study were:

1. To identify and describe positive and negative correlates of high and low research productivity among prominent doctoral level vocational education researchers employed at research oriented universities.

2. To determine if there were differences among these researchers by vocational service area, career stage, or sex.

3. To describe the factors perceived by agricultural education faculty members as enablers and inhibitors of research productivity.

4. To derive implications for graduate education and faculty development programs to facilitate research productivity.

METHODS AND PROCEDURES

The total sample consisted of faculty members in the various areas of vocational education employed in six research oriented universities that were members of the University Council for Vocational Education. To be included in the study, the university must have been included in the Clark and Guba (1977) listing of the 24 highest producers of education research and development or appeared in the top one-third of the 100 institutions rated by Schubert (1979) as high presenters for the 1975 to 1978 American Education Research Association annual meetings.

Also, the universities must have faculty members in five vocational service areas, including agricultural education.

Of the 101 faculty members contacted, 86 agreed to be interviewed (84 percent). Twenty-seven of the 31 agricultural educators contacted agreed to be interviewed for a participation rate of 87 percent. Agricultural education faculty members comprised one-third of the total sample.

The design of the study combined qualitative and quantitative strategies. The data collection devices consisted of a vita obtained from each of the participants before the personal interview was conducted. This enabled the interviewer to document the faculty member's research experience. During the interviews, a checklist facilitated the recording of data about the researchers including whether they received financial support during graduate school, whether they held an appointment as a teaching or research assistant, authorship while a graduate student, and the research assistance given by their doctoral adviser. A face to face interview was the means of gathering the qualitative information regarding topics such as their perceived writing competence and mentoring relationships.

To identify unusually high or low producing faculty members, a research productivity index was calculated. From eleven variables speculated to contribute to research productivity, the following eight highly intercorrelated indicators were selected to quantify research productivity: number of presentations, books, journal articles, popular articles, research reports, research grants, doctoral committees successfully chaired, and doctoral reading committees successfully completed. A standard score (z score) was calcualted for each of the eight factors for each faculty member. The eight z scores were summed for each faculty member and divided by the number of years since the faculty member had received the doctorate to yield a corrected research productivity index for each faculty member.

RESULTS

Findings for Vocational Education

Since the initial purpose of the study was to examine the unusually high and low research producing faculty, those who had a corrected research productivity index more than one standard above the mean were categorized as high producers (n=11). Accordingly, those with a corrected research productivity index more than one standard deviation below the mean were categorized as low producers (n=10). Table 1 shows the descriptive data for faculty members in each vocational education service area. Two of the 11 high producers (18 percent) were agricultural educators; 6 of the 10 faculty members in the low producing group were agricultural educators. Thus, agricultural education faculty members were under-represented in the high producing group and over-represented in the low producing group.

Content analysis indicated markedly different profiles of the high and low producers, and differences by service area, career stage, and sex. The high producer was typically an academically motivated person from his/her early years, and one who had moved rapidly from one academic challenge to the next. Although several had teaching experience at secondary, postsecondary, and higher education levels, the high producers sought additional academic work early in their careers. Most enjoyed and were expanded by their research courses and by researchers during their master's work and soon returned to seek the doctoral degree.

By the time this decision was made, the high producer had developed a close affiliation with the academic career and those within it. Most held a research associateship as a graduate student and had experience with a variety of aspects of the actual research process before beginning the dissertation. These writing and research projects often resulted in several publications before completing the degree.

Most high producers worked with or were advised by a mentor, someone who acted as a role model and a colleague. This person usually helped the fledgling researcher make valuable professional contacts and was often influential in obtaining the first position in academia. In all cases, this mentor was a male.

Accepting a position at a research oriented university was essential to the continuation of high research productivity. The "intellectual ethos" of the university stimulated the high producer to continue to conduct research and write and to work with doctoral candidates on a selective basis. Although most high producers reported enjoying teaching, their preference clearly is research. Professors in the high producers group were specifically classified in the general service area of vocational-technical education and held the rank of full professor.

On the other hand, the low producer identified much more strongly with teaching. The low producer generally enjoyed and stayed longer at each teaching position, seeking further academic work to improve teaching competence or because it was required by the profession.

Even while completing doctoral work, the low producer expressed no strong personal research commitment. Only half of them held research associateships, and very few felt any identity with researchers. Perhaps as a consequence of that limited identity, low producers reported smaller networks than their high producing colleagues. Upon receipt of the degree, several low producers accepted teaching positions in situations not conducive to research. The majority have exhibited little publication activity since earning the degree. All faculty classified as low research producers were in home economics education (40%) or agricultural education (60%) and were assistant professors.

Findings for Agricultural Education

Table 2 shows the vast range of scores for the 27 agricultural education faculty members on the variables used to generate the research productivity index. The wide range of scores on most variables foretells the diversity of experiences of this group of agricultural educators.

As one might expect, most agricultural educators grew up on a farm and were active in vocational agriculture and the FFA. Two-thirds were former FFA officers at local or state levels.

High school vocational agriculture teachers and teacher educators seem to have influenced the agricultural education faculty member's choice of a college major. While 8 of the 27 faculty members (about one-third) said that they had no particular reason for their choice of agricultural education as an undergraduate major, 12 (over 40 percent) reported that they were influenced by role models. Eight (30 percent) were influenced by a vocational agriculture teacher and another four were inspired by teacher educators. Another fifteen percent said that "if you were interested in agriculture, you either went into farming or teaching; it was the only career I knew."

Like most undergraduates, the choice of college had to do with its proximity to one's hometown (20%), cost (40%) or because it was the state university that people they knew attended (40%). Reflecting over their college years, three persons reported that they had an ambition to be a university professor, and seven were aware of research activities during this time. Although many were unsure of its influence on their later productivity, seven agricultural education faculty members had published at least one work by the time they received the baccalaureate degree.

Although only eight had a strong interest in secondary teaching upon entering the undergraudate program, all 27 agricultural educators spent several years teaching in secondary schools before, during or after receipt of the master's degree. While the duration of this teaching varied from one to 21 years, the average length of time was six years of high school teaching. Thirteen of the 27 agricultural educators held positions as teaching assistants, instructors, or other teacher education positions during graduate school for an average of three and a half years.

Nearly half (44%) did their master's on a part-time basis while teaching. Of the 13 agricultural education faculty members who were enrolled full-time for the master's degree, five were employed as research assistants and two as teaching assistants. Two were supported by EPDA fellowships and two used veterans benefits to support their graduate education.

Teacher educators in agriculture were by far the most influential persons in the decision of the agricultural education faculty members to return to graduate school for the doctorate. While more than one factor usually prompted enrollment in graduate school, ten named specific teacher educators with seven naming the head of the agricultural education department. Five faculty members indicated that researchers influenced their decision while four mentioned other graduate students as having been helpful in their decision. Six persons made their decision to return on their own.

As one might expect, others outside graduate school influenced the completion of the doctoral degree to some extent. Seventy percent of the agricultural educators reported that their wives were supportive and helpful in the completion of the degree. This support takes the form both of working outside the home and taking care of children and household tasks on a full-time basis.

The 27 faculty members in agricultural education generally entered Ph.D. programs (74%) in large Midwest universities. Twelve people hold degrees in agricultural education, nine have degrees in education, and six earned the degree in vocational education.

The most helpful enabling experiences faculty members had with respect to research during graduate school fell into three general categories. The first category--content enablers--includes courses in research methods and statistics, computer use, proposal and research critiques, work on actual research projects and getting work published. Context enablers, the second category, include intellectual ambience factors such as work with other researchers as they conduct, teach and discuss research, discussion with other graduate students, and the overall tone that is projected by the department and the university. The third category--collaborative factors--includes help from advisers or researchers, having a research fellowship or a dissertation research grant and developing strong management skills by the example of others.

The absence of the following three factors was frequently reported as inhibitors: lack of quality teaching about or reflection on research components, no time for research so the press of teaching responsibilities seemed great, and little or no perceived support from the adviser or significant others.

In fact, having an adviser who is a competent researcher or direct contact with an active researcher was deemed the most significant influence by over half of the 27 agricultural education faculty members interviewed. Others credited their adviser with helping them get through the doctoral program and "learn the chain of reasoning" involved in research.

Upon completion of the doctorate, nearly 60 percent of the agricultural educators were offered a position at the doctoral institution. Another nineteen percent accepted positions at a research center or in another research oriented university. Three accepted administrative or teaching positions outside the university setting. Most have been in their present institution at least four years.

In their present position, interacting with peers at research meetings such as this and interacting by telephone are the favored methods of networking about research. The number of people with whom agricultural educators discuss research ranged from 3 to 27 with an average of nine.

Although the typical agricultural education faculty member reads or skims four journals and three popular publications each month, there was quite a range in the number of periodicals read. Almost one-fourth of the group read or skimmed as few as two journals monthly while 10 percent reviewed more than six journals on a regular basis.

Perceived institutional and departmental support for research are seen as the most important enablers to research productivity. Nine faculty members indicated that being at a research oriented university was critical, while ten persons noted that the help and support of colleagues within the department was useful. The six persons who had discovered ways to relate their research and teaching to each other also noted this to be a positive factor.

Presentations at this annual research meeting and regional research conferences were noted by 10 faculty members as being significant. Such national and regional visibility in one's research brings additional opportunities for collaboration, publication, and research grants. With respect to the latter, agricultural educators reported that research grants provide resources for graduate assistants, clerical assistance, and supplies that make it possible to plan and conduct research.

The agricultural education faculty members interviewed made it clear that productive researchers are self-starters with high motivation to do research. They also indicated that advising graduate students who are conducting research encourages their own research productivity.

Agricultural educators indicated that some graduate students are interested in attaining the doctoral degree for reasons other than to do research. In these cases there is less opportunity for faculty-graduate student collaboration on papers and research grants.

Several faculty members in agricultural education—one-third of the 27 interviewed—feel that agricultural education has not emphasized research and scholarship nearly enough. Most of the faculty members—16 of the 27 faculty members interviewed—are primarily teaching or service oriented. Although some of the faculty members had a 25 percent time research appointment, it was felt that this was simply not enough time to do research. Thus, one has to resort either to not publishing very much, doing mostly review, synthesis or conceptual pieces, or doing only fundable research. Three of the faculty members felt that their department's association with a college of education rather than a college of agriculture works to the detriment of their research productivity as opportunities for research support are more limited.

Several faculty members indicated that they felt deficient in research attitudes or research skills such as writing, statistics or research methodology. In all, one might say that some agricultural educators simply do not have research productivity as a high priority and thus, as one interviewee indicated, "do not work to minimize the inhibitors and maximize the enablers."

CONCLUSIONS AND RECOMMENDATIONS

Faculty members in agricultural education in major research universities are less productive researchers than their colleagues in other vocational education service areas. Possible explanations for this level of research productivity reside in the factors that have been identified as enablers or inhibitors of research productivity.

The evidence is clear that several factors enable research productivity. An important factor is personnel—faculty members—who have specialized knowledge and skill in the design, conduct, and reporting of research. These content enablers include, in addition to competence in research methodology and statistics, expertness in conceptualizing significant problems, knowledge of theory and research that impact on the problems under investigation, the use of the computer as a research tool, skillfulness in interpretation, and the talent to communicate clearly and concisely. Concomitant enablers are attitudinal and motivational traits of researchers that demand both productivity and scholarship.

The evidence is quite clear also that certain context factors contribute directly to the acquisition and further development of the competence and attitudes that enable research productivity. For the graduate student these factors include, in addition to formal course work, active and meaningful participation in research spanning all phases of the research process from formulating problems to reporting results. For the productive faculty member this means continuing involvement in research efforts, the advising of graduate students and the supervision of their research, and collaborative efforts with other researchers. An essential companion to the context factors is collaboration best described as a mentor for graduate students and junior faculty members and as a network of colleagues for experienced researchers.

In a real sense, the absence of these content, context, and collaborative factors defines the major inhibitors to research productivity. The exception to this statement is that the degree of priority given research, both individually and institutionally, and the resources made available to support research determine the extent to which the content, context, and collaborative factors, even when present in abundance, actually result in research productivity. In agricultural education, past practice—and in most instances present practice—places higher priority on teaching and service than on research. Until agricultural education departments and faculties and the colleges and universities in which they are located assign a priority and monetary resources to the research mission that equal the priority and resources allocated to teaching and service, the presence of the enablers of research productivity are likely to yield less than what is expected or possible. Major strides in research productivity are improbable as long as the research function is the incidental and less well funded part of the teaching-service-research mission of agricultural education in land grant universities.

We conclude with this important recommendation. The quest for higher research productivity by agricultural education faculty members will be for naught if it is not accompanied by an equivalent zeal for the production of research that exhibits the highest standards of rigor and scholarship.

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Table 1

Research Productivity of Faculty Members by Vocational Education Service Area

Variable	Means by Service Area Agr. (n=27)	H. Ec. (n=16)	Bus. Off. (n=13)	Dist. Ed. (n=8)	Voc. Ed. (n=22)
Years Since Doctorate	12.9	7.9	12.23	10.0	14.4
Number of:					
Presentations	41.8	25.3	57.1	35.5	100.8
Journal Articles	15.1	10.8	18.2	10.4	29.8
Books and Monographs	3.9	1.8	4.4	4.6	9.8
Popular Articles	4.3	1.6	5.6	1.9	3.4
Research Reports	6.3	2.0	4.1	2.8	12.7
Doctoral Committees Chaired	8.0	2.8	8.8	6.5	12.5
Doctoral Committees Completed	21.1	7.1	15.9	18.6	35.0
Research Grants	2.5	2.1	2.3	1.4	5.8
Corrected Research Productivity Index	6.8	6.8	10.0	7.7	12.2

Table 2

Descriptive Statistics for Factors Indicating
Research Productivity of Agricultural Educators
(n=27)

Variable	Mean	Minimum	Maximum	Range
Years Since Doctorate	12.9	2	32	30
Number of:				
Presentations	41.8	3	125	123
Journal Articles	15.1	0	59	59
Books and Monographs	3.9	0	10	10
Popular Articles	4.3	0	24	24
Research Reports	6.3	0	37	37
Doctoral Committees Chaired	8.0	0	40	40
Doctoral Committees Completed	21.1	0	160	160
Research Grants	2.5	0	7	7
Corrected Research Productivity Index	6.8	-0.53	15.28	14.75

VIRGINIA TECH

A National Assessment of Agricultural Education Student Organizations

by
Michael Rush
and
John Hillison

AGRICULTURAL EDUCATION

**Virginia Polytechnic Institute &
State University**

Agricultural Education
Virginia Tech

National
Agricultural Education
Research Meeting
December 1983

Blacksburg, Virginia 24061

Student organizations have long been considered an important part of agricultural education. This tradition has carried over into higher education, with youth organizations serving partly the same purposes as in secondary vocational agriculture, and partly purposes unique to higher education. Identification of how student organizations are being used and how individuals perceive their use is important to insure the effectiveness and usefulness of faculty time spent working with these organizations.

Although many studies have analyzed the use of youth organizations at the secondary level, few have analyzed youth organizations in agricultural education at the collegiate level. This study was an effort to fill that void.

Objectives of the study

The major purpose of this study was to determine the characteristics of student organizations in agricultural education departments in colleges and universities across the United States. Specific objectives included:

(1)To determine the number of agricultural education clubs (AEC), agricultural education societies (AES), Alpha Tau Alpha chapters (ATA), and collegiate FFA chapters (FFA).

(2)To determine the academic rank of agricultural education student organization advisors

(3)To determine the percentage of agricultural education clubs, agricultural education societies, Alpha Tau Alpha chapters, and collegiate FFA chapters that have current, written programs of activities.

(4)To determine the desirability of holding national competition among agricultural student organizations as determined by officers and advisors of the different organizations.

(5)To compare the perceptions of officers and advisors on the importance placed on current activities conducted by student organizations.

(6)To compare the perceptions of officers and advisors on the importance that should be placed on activities conducted by student organizations.

(7)To determine the extent to which agricultural education student organizations are meeting the expectations of officers and advisors involved in the organizations.

(8)To compare the priorities of the different student organizations as perceived by officers and advisors.

Procedure

Methods

The methods used to accomplish the objectives were as follows:

(1)During the months of August and September 1982, student officers and advisors for the three agricultural education student organizations at Virginia Tech established an item pool by writing statements on objectives and purposes of such organizations.

(2)During December 1982 the item pool was added to and modified by the two project directors and three additional faculty members in agricultural education at Virginia Tech. This process resulted in 23 items which were then placed in a total of seven categories consisting of (a) service, (b) recruitment/promotion (c) professionalism, (d) skill development, (e) recognition, (f) faculty/student interaction, and (g) socialization.

(3)A questionnaire was then developed using the 23 items along with other selected questions seeking demographic data, information about programs of activities, and information about the desirability of national competition. A five point Likert-type scale was used for evaluating the 23 items with 1 representing "little importance" and 5 representing "great importance."

(4)On January 28, 1983 packets of instruments were mailed to advisors identified in the *Directory of Collegiate FFA and Ag Ed Organizations*. In addition, a packet of instruments was sent to department heads for departments not identified in the *Directory*.

(5)A postcard follow-up was sent to nonrespondents on February 15, 1983.

(6)On March 28, 1983 a second mailing of a packet of instruments was sent to nonrespondents from the first mailing.

(7)All data were received by May 2, 1983.

(8)All data were analyzed utilizing frequencies, means, t-tests, and analysis of variance by May 9, 1983.

Findings

Questionnaires were mailed to 88 departments determined as having teacher education programs for vocational agriculture. Of those departments contacted, 76 responded for a return rate of 86.4%. Seventy (92.1%) of those departments did have one or more agricultural education student organizations. Sixteen departments returned questionnaires for two student organizations and 1 department returned questionnaires for three. For those departments with more than one organization, the most common pattern was an Alpha Tau Alpha (ATA) chapter combined with either an Agricultural Education Club (AEC), an Agricultural Education Society (AES), or a Collegiate FFA. A total of 431 usable questionnaires were received, including 92 from advisors. The mean number of respondents per school was 6 and the mean number of respondents per organization was 5.

The first part of the questionnaire asked for descriptive information about the agricultural education organizations. Table 1 presents a summary of demographic data on the respondents to the survey.

Collegiate FFA was by far the most popular organization composing 47% of the respondents. ATA was second with 24%. Overall, 70% of the student officer respondents were male and 30% were female. Of the advisors, 96% were male and 4% were female.

Seven "other" agricultural education organizations were identified in the responses. These were: World Agricultural Service Society; Collegiate 4-H; Agricultural and Extension Education Club; Future Vocational Agriculture Teachers; IVATA-Student Chapter; Rural Development Club; and the Agricultural Science Organization.

Table 1
Demographic Data on Responses

Organizations	Number of organizations	Number of respondents			Sex of respondents (%)	
		Advisors	Students	Total	Male	Female
AEC	12 (14%)	12	42	54	69	31
AES	7 (8%)	12	28	40	67.5	32.5
ATA	21 (24%)	18	67	85	75	25
FFA	41 (47%)	44	190	234	78	22
Other	7 (8%)	6	10	16	81	19
Total[1]	88	92	337	429	75.5	24.5

[1] These totals are slightly different than the overall statistics given because a few respondents did not indicate their club affiliation and/or office.

The class standing or faculty rank of the respondents were also determined. These results are presented in Table 2.

These data indicate that the majority of the leadership for agricultural education organizations come from the upperclass students. These data also indicate that the advisors for the organizations are primarily full-time, permanent faculty members.

Table 3 presents the percentages of organizations having current programs of activities and also percentages of respondents supporting competition among student organizations.

Approximately three-quarters of the organizations had a current program of activities that was updated annually. Agricultural education societies had the highest percentage (86%) while the agricultural

Table 2
Percentage of Respondents in Various Classes and Faculty Ranks

Students	%	Advisors	%
Senior	36	Professor	27
Junior	38	Associate Professor	29
Sophomore	17	Assistant Professor	35
Freshman	2	Instructor	2
Graduate	4	Graduate assistant	6
Other	3	Other	1

education clubs had the lowest (50%).

Overall, 81% of the respondents supported competition, while 19% opposed competition. Officers, however, were much more supportive of the competition than the advisors. Eighty-six percent of the officers supported competition while only 60% of the advisors did so.

Table 3
Percentage of Clubs Having a Program of Activities and Desiring Inter-club Competition

Organizations	Program of activities		Would like competition	
	Yes %	No %	Yes %	No %
AEC	50	50	80	20
AES	86	14	74	26
ATA	75	25	78	22
FFA	81.5	18.5	83	17
Other	57	43	75	25
Overall	74	26	81	19

The second part of the questionnaire asked for perceptions of officers and advisors of agricultural education youth organizations about those organizations. A total of 23 activities were identified and grouped into seven categories. These included service (3 activities), recruitment/promotion (3 activities), professionalism (3 activities), skill development (5 activities), recognition (3 activities), student/faculty interaction (3 activities), and socialization (3 activities). An aggregate variable was also created by averaging a respondent's ratings of all of the activities. The respondents were asked to rate each of the activities twice: once on the emphasis the organization was currently placing on the activity and once on how much emphasis the organization should give to the activity. The ratings were based on a 5 point scale with 1 representing "little importance" and 5 representing "great importance". A t-test for each of the 7 categories was conducted to compare officer and advisor ratings. Mean ratings of the perceptions of advisors and officers on current emphasis and on what that emphasis should be is presented in table 4.

All of the ratings for current emphasis by both advisors and officers fell between 3.4 and 3.9. Professionalism and socialization were rated the highest by the officers (3.7). Socialization was rated the highest by the advisors (3.9) with professionalism and faculty-student interaction next at 3.8. The only ratings that were significantly different were faculty/student interactions. The advisors rated that particular category higher than the officers.

There were no differences between the ratings of advisors and officers on how much importance the categories should have in the organizations. Professionalism was considered the most important category by both officers and advisors (4.4). Advisors also rated recruitment/promotion as an equally important goal (4.4).

Table 4
Mean Ratings of the Perceptions Given to Various Activity Categories of Agricultural Education Student Organizations

Categories	Current Emphasis		Should Be	
	Officers	Advisors	Officers	Advisors
Service	3.36[1]	3.20	16	3.69***
Recruitment/promotion	3.65	3.67	4.43	4.43
Professionalism	3.73	3.79	4.38	4.44
Skill development	3.47	3.59	4.17	4.12
Recognition	3.39	3.56	4.14	4.17
Faculty/student interaction	3.60	3.83*	4.27	4.26
Socialization	3.72	3.91	4.34	4.27
Aggregate	3.56	3.65	4.27	4.19

[1] 1=Little importance; 5=Great importance.
*$p < .05$. ***$p < .001$.

Table 5 provides a summary of the mean ratings of all the respondents, comparing the current situation with how the respondents thought it should be.

The respondents as a whole thought socialization (3.75) was currently being emphasized the most in agricultural youth organizations with professionalism a close second with a rating of 3.7. Service was rated the lowest at 3.3. The respondents perceived all of the roles indicated as being more important than the emphasis they were currently receiving. The differences between the current situation and what they thought it should be were all significant at the .001 level. The two roles with the highest overall rating were recruitment/promotion and professionalism (4.4).

Table 5

Mean Ratings of the Perceptions of All the Respondents Given to Various Activity Categories of Agricultural Education Student Organizations

Categories	Current emphasis	Should be
Service	3.33[1]	4.06*
Recruitment/promotion	3.66	4.43*
Professionalism	3.75	4.39*
Skill development	3.49	4.16*
Recognition	3.43	4.15*
Faculty/student interaction	3.66	4.27*
Socialization	3.76	4.33*
Aggregate	3.58	4.25*

[1] 1=Little importance; 5=Great importance

*$p < .001$.

Comparisons among the different types of organizations are given in table 6. A Scheffe post hoc test showed that respondents from Collegiate FFA clubs rated current emphasis given to service significantly higher than either ag ed club or ATA chapter respondents. FFA respondents also rated current emphasis on skill development higher than ag ed club respondents. Ag ed society respondents rated the recognition category significantly higher than ag ed club respondents and rated socialization significantly higher than ATA chapter respondents. Overall, ag ed society respondents rated current emphasis being given the various categories significantly higher than ag ed club respondents.

Comparisons of what officers and advisors believed their organizations should emphasize are presented in table 7.

A Scheffe post hoc test indicated significant differences between several of the organizations. Respondents from collegiate FFAs believed

Table 6

Mean Perceptions of Respondents of Each Agricultural Education Student Organization on the Emphasis Currently Being Given to the Activity Categories

Categories	AEC (n=54)	AES (n=40)	ATA (n=85)	FFA (n=234)	F value
Service	3.01[1]	3.22	3.08	3.54	9.691***
Recruitment/promotion	3.56	3.75	3.62	3.70	.629
Professionalism	3.59	3.83	3.97	3.73	2.564
Skill development	3.21	3.58	3.33	3.62	5.373**
Recognition	3.15	3.88	3.43	3.48	4.772*
Faculty/student interaction	3.48	3.93	3.58	3.72	1.921
Socialization	3.74	4.13	3.61	3.79	3.384*
Aggregate	3.40	3.76	3.49	3.66	3.457*

[1] 1=Little importance; 5=Great importance.

*p<.05. **p<.01. ***p<.001.

service should be more important than respondents from either ag ed societies or ATA chapters. Respondents from ATA chapters did not believe skill development should receive as much emphasis as did respondents from the other three clubs. Ag ed societies rated recognition significantly higher than did ATA chapters. Ag ed society and collegiate FFA respondents rated socialization higher than did ATA chapter respondents. Finally, ag ed society and collegiate FFA respondents rated the overall emphasis that should be given all of the categories higher than did ATA chapter respondents.

Major Findings

1. Over 92% of the departments of agriculture education responding had youth organizations.

2. The Collegiate FFA was the most common type of organization making up 47% of the organizations.

3. Ninety-one percent of the advisors are assistant professors, associate professors, or professors.

4. Thirty percent of the officer respondents were female while 4% of the advisors were female.

5. Seventy-four percent of the organizations had an annually updated program of studies.

6. Eighty-six percent of the officers supported competition while only 60% of the advisors supported competition.

Table 7
Mean Perceptions of Respondents of Each Agricultural Education Student Organization on the Emphasis That Should be Given to the Activity Categories

Categories	AEC (n=54)	AES (n=40)	ATA (n=85)	FFA (n=234)	F value
Service	3.94[1]	3.86	3.74	4.23	11.099***
Recruitment/promotion	4.43	4.60	4.37	4.42	1.350
Professionalism	4.32	4.47	4.49	4.35	1.499
Skill development	4.18	4.37	3.85	4.23	8.600***
Recognition	4.17	4.37	3.96	4.19	3.600**
Faculty/student interaction	4.28	4.39	4.10	4.31	2.165
Socialization	4.36	4.47	4.09	4.39	5.712***
Aggregate	4.24	4.36	4.08	4.30	4.360**

[1] 1=Little importance; 5=Great importance.
**$p<.01$. ***$p<.001$.

7. Advisors and officers were generally in agreement with current emphasis being given various activities and the importance those activities should receive.

8. Faculty rated improving faculty/student interaction as currently being given more emphasis than did the officers.

9. Both officers and advisors rated socialization as the category that was currently the most important. Students also rated professionalism as being currently as important as socialization.

10. Faculty thought recruitment/promotion and professionalism should be the most important categories and thought service should receive the least attention.

11. Officers thought professionalism should be the most important, but rated all of the "should be" categories very similarly.

12. The respondents thought all of the categories should receive more emphasis than was currently being given.

13. Service and recruitment/promotion were the two categories considered furthest from their ideals.

14. Socialization was the category considered closest to its ideal.

15. The respondents as a whole thought all of the categories of service, recruitment/promotion, professionalism, skill development, recognition, faculty/student interaction, and socialization should receive an importance rating of higher than a 4 on a 1 to 5 scale with 5 representing "great importance."

16. Collegiate FFA clubs were rated as giving more current emphasis to service than either ag ed clubs or ATA chapters. Respondents from

collegiate FFA chapters also believed that service should receive more emphasis than respondents from the other two clubs.

17. Ag ed Society respondents rated current emphasis given to the categories as a whole significantly higher than ag ed club respondents.

18. Respondents from ATA chapters did not believe skill development should receive as much emphasis as did respondents from the other three clubs.

19. Ag ed society and collegiate FFA respondents gave a higher overall mean rating to the categories than did the ATA chapter respondents.

Discussion and Conclusions

Objective 1. A total of 70 institutions out of 76 responding and 88 identified had agricultural education youth organizations. This fact would indicate that most teacher education departments believe youth organizations are a valuable part of the teacher education program. The most common organization was the Collegiate FFA with 41 chapters in the United States. There were 21 Alpha Tau Alpha chapters, 12 agricultural education clubs, and 7 agricultural education societies. The institutions that had more than one organization usually had an ATA chapter along with some other organization. Since the ATA is an honorary organization whose membership depends on grades and other factors, it would seem that most departments believe it is important to have a youth organization available for all the students regardless of academic position. It was also interesting to note that a few institutions had other titles for their youth organizations. Two had an extension or 4-H emphasis. One had an international emphasis and two appeared to be closely tied to the professional organizations.

Objective 2. The predominant professorial rank for youth organization advisors was assistant or associate professor (64%). The next most common rank was professor (27%) with only a small percentage of instructors and graduate assistants (8%). These data also seem to indicate that youth organizations are considered an important part of the teacher education programs.

Objective 3. The majority of the youth organizations did have a current, annually-updated program of activities. Eighty-six percent of the AES chapters had programs with FFA chapters not far behind with 81%. Agricultural education clubs had the lowest percentage with 50%. The support for a planned program of activities also indicates the support for active youth organizations in agricultural teacher education.

Objective 4. National competition among the youth organizations was supported by 81% of the respondents. Only 60% of the advisors, however, supported competition while 86% of the officers supported competition. Several questionnaires were returned with comments from advisors qualifying their response to the competition question. These results would indicate support for development of some sort of national competition.

Objective 5. Students and advisors had considerable agreement on how they perceived present categories of the youth organizations. All of the officer ratings fell between 3.4 and 3.6 and the advisor ratings fell between 3.2 and 3.8. Service received the lowest rating by advisors and was tied with recognition for the lowest rating by the officers. The only category that was significantly different was improving student/faculty interaction with the advisors rating it higher than the officers. Socialization was rated as the most important current category by both the advisors and the officers.

Objective 6. Students and advisors had even more agreement on what youth organizations should be doing. No items showed a significant difference between the two groups. Advisors rated recruitment/promotion and professionalism as the two most important categories and rated service categories the lowest. Evidently, advisors see the agricultural youth organization as a key extension of the department as a public relations tool, but not as a service organization. Students rated professionalism as the most important, but ratings on all categories only varied from 4.1 (recognition) to 4.4 (professionalism).

Objective 7. The respondents believed all of the categories should receive more attention than they are currently receiving. The two categories with the biggest difference between current emphasis and what should be were service and recruitment/promotion. The category that was rated closest to its ideal was socialization. This would seem to indicate that the organizations are doing a good job of helping the students fit into the universities and departments, but need to work on specific outreach programs where the clubs start reaching beyond the specific student needs.

Objective [illegible]. A comparison of the ratings of officers and advisors of the different organizations indicated that the organizations did have different priorities for what they thought the organizations should be doing. Collegiate FFA chapters rated service activities higher than either ATA chapters or ag ed clubs. Ag ed societies believed recognition should receive more emphasis than did ATA chapters and ag ed societies and collegiate FFAs rated socialization higher than did ATA chapters. Overall, ag ed societies and FFA chapters had a higher mean rating for the categories than did the ATA chapters. The categories rated the highest by the ag ed club respondents were recruitment/promotion and socialization. The category rated the highest by the ag ed society respondents was recruitment/promotion. The highest category for the ATA chapter respondents was professionalism. Collegiate FFA respondents rated recruitment/promotion, professionalism, and socialization as their highest categories. The collegiate FFA also had the smallest difference between the activity categories, rating them all between 4.2 and 4.4

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CRITIQUE

LEADERSHIP AND PERSONAL DEVELOPMENT ABILITIES POSSESSED BY HIGH SCHOOL SENIORS WHO ARE FFA MEMBERS IN SUPERIOR FFA CHAPTERS, NON-SUPERIOR CHAPTERS, AND BY SENIORS WHO WERE NEVER ENROLLED IN VOCATIONAL AGRICULTURE

by

Samuel C. Ricketts and L. H. Newcomb
Ohio State University

JOB PLACEMENT AS INFLUENCED BY AGRICULTURE BACKGROUND OF VOCATIONAL AGRICULTURE STUDENTS

by

Joseph H. Mick, Bob Stewart, and Donald M. Claycomb
University of Missouri

A STUDY OF HORTICULTURE PROGRAMS IN WHICH SPECIAL NEEDS STUDENTS ARE ENROLLED

by

Joseph J. Nawoczenski and Connie Baggett
Pennsylvania State University

Concurrent Session C, 8:30 - 10:00 a.m.,
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National Agricultural Education Research Meeting
American Vocational Association
Anaheim, California

Discussant

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LEADERSHIP AND PERSONAL DEVELOPMENT ABILITIES POSSESSED BY HIGH SCHOOL SENIORS WHO ARE FFA MEMBERS IN SUPERIOR FFA CHAPTERS, NON-SUPERIOR CHAPTERS, AND BY SENIORS WHO WERE NEVER ENROLLED IN VOCATIONAL AGRICULTURE

SAMUEL C. RICKETTS AND L. H. NEWCOMB
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In an attempt to answer the question, "Does FFA make a difference?", the researcher's pioneered an investigation to determine if leadership and personal development skills are truly developed through the FFA. My critique of their research paper will include two basic parts: points of commendation and questions to consider.

The researchers are to be commended on the following points:

1. Research objectives that specifically identify the variables considered in the investigation.
2. Systematic development of a research instrument that yielded a high (.86) reliability coefficient.
3. Selection and use of a research instrument developed through prior research efforts.
4. Systematic data gathering procedures to obtain a high (93%) response rate.
5. Appropriate use of statistics in analyzing the data.
6. Tests for difference among groups on selected independent variables.
7. Conclusions based on empirical evidence.

The following are questions that the researchers may want to consider:

1. Was the literature completely void of information related to the study?
2. Was the sample (16 schools) of adequate size for the population? How many schools were in the target populations? What percent of the population does the sample constitute?
3. What was the reliability on the student questionnaire developed by Welton (1971)?
4. How were leadership and personal development ability and FFA activeness measured?
5. Were hypotheses formulated and an alpha level established at the outset for statistical tests among groups?
6. What is the practical significance between variables represented by a Pearson Product Correlation Coeficients of .16 and .10 that were statistically significant at the .05 level?
7. What would be an acceptable leadership and personal development ability score? (Conclusion Number 6 stated that scores were "far lower than that with which the profession can be pleased.")

In summary, the researchers have scratched the surface in answering the question: Does FFA make a difference? In fact, the researchers may have raised more questions related to the effectiveness of the FFA than they answered. Is the FFA serving effectively as a vocational agriculture laboratory for the development of leadership and personal development skills?

JOB PLACEMENT AS INFLUENCED BY AGRICULTURE BACKGROUND OF VOCATIONAL AGRICULTURE STUDENTS

JOSEPH H. MICK, BOB STEWART, AND DONALD M. CLAYCOMB
UNIVERSITY OF MISSOURI

Recognizing that job placement is the ultimate objective of vocational agriculture, these researchers were searching for student variables that influence job placement. Two lists were developed in my critique of this paper, points of commendation and questions to consider.

The researchers are to be commended on the following points:

1. Identification of a research problem of great importance to the agricultural education profession.
2. Including a brief review of relevant literature.
3. Clearly stated research objectives that identify variables included in the investigation.
4. Statement of null hypotheses and alpha level for testing at the outset of the research.
5. Statistical procedures were used in determining sample size needed to be representative of the population.
6. Utilization of existing data banks (records of Missouri Department of Elementary and Secondary Education).
7. Use of appropriate chi-square tests when the expected cell sizes are small in analyzing the data.
8. Formulation of conclusions and implications for improvement of vocational agriculture programs.

The following are questions that the researchers may want to consider:

1. Why were variables related to classroom-laboratory and FFA components of vocational agriculture not included in the investigation? Are they not as important to job placement as SOE-related variables?
2. What was the population for this study? (Was the population vocational agriculture seniors in Missouri high schools in 1975 through 1982, or just 1977 seniors?)
3. Were the instruments developed and used in the research reliable? What is the meaning of the term "workable" with regard to a research instrument?
4. What procedures could be used in future research efforts to increase the return rate?
5. Why was data limited to job placement in making the decisions that respondent and non-respondent groups were similar?
6. What was the nature of the SOE ownership and placement programs of students? Were all SOE programs agriculture production oriented?

7. What were the occupational objectives of the students when enrolled in vocational agriculture? (This may have been a key question that was not included in the investigation.)
8. The finding that "students with ownership SOEPs were more likely to be engaged in full-time agricultural occupations" raises a question; were these occupations mostly in the area of agricultural production?
9. Should vocational agriculture teachers be concerned with equalizing opportunities for SOEPs for all students or concerned about experiences that will develop competencies related to occupational goals of students?

In summary, these researchers have asked an important question but provided only very limited answers in this investigation. More research is needed on the effect of processes (SOPEs, FFA, etc.) used in vocational agriculture programs on the products of such programs. State department personnel and other educators need a plan that will collect appropriate data for use in evaluating program outcomes.

A STUDY OF HORTICULTURE PROGRAMS IN WHICH SPECIAL NEEDS STUDENTS ARE ENROLLED

JOSEPH J NAWOCZENSKI AND CONNIE BAGGETT
PENNSYLVANIA STATE UNIVERSITY

Are vocational agriculture programs serving special needs students as mandated by law? This was the research problem identified by these Pennsylvania State University researchers. A lot of lip service has been given to mainstreaming special needs students into regular classes and programs; but how effective is mainstreaming compared to education provided through special needs programs? The critique of this research will include points of commendation and questions to consider.

The researchers are to be commended on the following points:
1. Including a brief review of related literature.
2. Identification of an important research problem.
3. Clearly formulated research questions.
4. Provided biographical data for responding horticulture teachers in Pennsylvania.
5. Use of tables to summarize findings.
6. Carefully drawn conclusions with implications for program improvement.

The following are questions that the researchers may want to consider:
1. What was the population and sample for the study?
2. Was the instrument used reliable?
3. Was a check made of non-respondents to determine if they differed from respondents. An assumption that the 57.7 percent response rate is representative of the population may not be true.
4. How many special-needs students were being served by the responding teachers.

5. Was research question Number 1 answered?
6. How do EMR/LD students best learn? How does this compare to types of assistance teachers indicated they needed?

In summary, this research addressed a very important problem and asked three important research questions, but provided only very limited answers. The researchers need to check their instrumentation closely to determine if data is being collected to adequately answer the research questions for the investigation.

LEADERSHIP AND PERSONAL DEVELOPMENT ABILITIES POSSESSED BY HIGH SCHOOL SENIORS WHO ARE FFA MEMBERS IN SUPERIOR FFA CHAPTERS, NON-SUPERIOR CHAPTERS, AND BY SENIORS WHO WERE NEVER ENROLLED IN VOCATIONAL AGRICULTURE

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INTRODUCTION

If the agricultural education profession and those involved in the world of work are to prepare vocational agriculture students for specific occupations, they must develop the "total" individual. The student entering the world of work must be not only technically competent, he/she must also possess leadership and personal development abilities. Besides the technical skills that are taught in a vocational agriculture program, leadership and personal development skills are also taught through the use of the Future Farmers of America organization.

There has been much rhetoric as to the learning attributed to the FFA. Testimonials have come from civic leaders, legislators, administrators and others. The value of the FFA is generally assumed to be beneficial to the personal growth and development of the members. However, the research at this time has not been successful in establishing, through empirical evidence, specifically what members learn by being in the FFA. Therefore, a real need existed for a comprehensive study of the FFA and vocational agriculture to see if the leadership and personal development skills, which the FFA boasted that it developed, were in actuality learned by the FFA members.

PURPOSE

The primary purpose of this study was to describe the leadership and personal development abilities that were possessed by four groups of high school seniors; namely, those who participated in high-quality (superior) FFA chapters, low-quality (non-superior) FFA chapters, and by those high school seniors from schools with superior and non-superior FFA chapters who were never enrolled in vocational agriculture.

OBJECTIVES

The objectives of the study are reflected in the following research questions:

1. What are the differences in the level of leadership and personal development ability of students in superior FFA chapters, non-superior FFA chapters and students with no vocational agriculture and FFA?

2. What is the relationship between level of leadership and personal development ability and activeness in the FFA?

3. What is the relationship between level of leadership and personal development ability and the following possible extraneous variables: socio-economic status, grade point average, intelligence test score and other school and community activities?

METHODOLOGY

Sample Investigated

Active FFA members in traditional vocational agriculture four-year programs in Middle Tennessee comprised the target population for this study. The sample for this study was 12th grade senior males in Middle Tennessee who were enrolled in vocational agriculture and FFA programs from eight randomly selected superior FFA chapters and eight randomly selected non-superior FFA chapters. Senior males from the same 16 schools who were never enrolled in vocational agriculture were also a part of the study.

Instrumentation

Two instruments were developed to gather data. The first instrument, identified as the Student Questionnaire, was developed to secure information from students relative to their socio-economic status, grade point average, intelligence test score and school and non-school activities. FFA members were asked additional information about the activities in which they participated as FFA members. The second instrument which consisted of 66 criterion-referenced multiple choice questions was developed to measure leadership and personal development abilities of the senior males.

Validity and Reliability of the Instrument

The instruments were reviewed by a panel of experts to evaluate the validity of the instruments. After revisions, the instruments were pilot tested. A Kuder-Richardson 20 reliability coefficient of .86 was obtained on the second instrument which included the 66 question criterion-referenced test measuring leadership and personal development abilities. The reliability of the first instrument (Student Questionnaire) was established during the earlier studies by Welton (1971) and Rathbun (1974).

Data Gathering Procedure

Each school principal was visited by the investigator in order to secure permission to collect data in his/her school. The guidance counselor was then visited to ask for cooperation in administering the measuring instrument to the students and obtaining information from the students' records. A total of 258 usable instruments were returned from the vocational agriculture teachers or guidance counselors to the investigator which represented a student response rate of 93%. High school grade point averages and Tennessee high school state proficiency test scores were requested for 23 of the non-respondents. The high school grade point averages of the non-respondents and the Tennessee high school state proficiency test scores of the non-respondents were similar to the respondents.

Data Analysis

Data were analyzed using analysis of variance, analysis of co-variance, Scheffe Test, Pearson Product Correlations and other appropriate statistics utilizing the SPSS computer program.

Description of the Four Groups of Students

The similarity of the four groups on selected independent variables is shown in Table 1. The groups had similar socio-economic status, high school grade point averages and state proficiency test scores. The activeness of the groups in school and non-school activities was also similar. Except for the vocational agriculture students in non-superior FFA chapters, the groups varied less than two points on all six variables. This difference was not significant at the .05 level.

RESULTS

Leadership and Personal Development Ability

There was a statistically significant difference among the four groups on the test scores measuring leadership and personal development abilities when high school grade point average was taken into account. The F value when high school grade point average was taken into account was 18.30 with the significance of F being .001 as reported in Table 2.

In order to determine where the significant differences were among the four groups, a Scheffe test was calculated. Table 3 reports that ther was not a significant difference at the .05 level between vocational agriculture/FFA students from superior FFA chapters and vocational agriculture/FFA students from non-superior FFA chapters. Furthermore, there was not a significant difference at the .05 level between the vocational agriculture/FFA students from non-superior FFA chapters and non-vocational agriculture students from schools with superior FFA chapters.

However, there was a significant difference at the .05 level between vocational agriculture/FFA students from superior FFA chapters and the non-vocational agriculture students. There was also a significant difference at the .05 level between non-vocational agriculture students from schools with superior FFA chapters and non-vocational agriculture students from schools with non-superior FFA chapters.

FFA Activeness

The vocational agriculture students/FFA members from superior FFA chapters were somewhat more active than vocational agriculture students/FFA members from non-superior chapters in each of the four levels of participation (chapter, district and regional, state and national levels). The relationship between level of leadership and personal development ability and activeness in the FFA is reported in Table 4.

Activeness in the FFA at the chapter level had a higher correlation with leadership and personal development abilities ($r = .48$) than activness at the district or regional ($r = .43$), state ($r = .39$) or national ($r = .07$) levels. There was a greater degree of relationship between the leadership and personal development abilities of students from superior FFA chapters and their level of state activeness ($r = .47$) than there was for students from non-superior FFA chapters (r = .16). All correlations were significant at the .05 level except for national activeness.

Extraneous Variables

The relationship between the level of leadership and personal development and the following possible extraneous variables was calculated by using Pearson Correlation Coefficients: socio-economic status, grade point average, intelligence test score and other school and community activities. Table 5 reports these relationships.

High school grade point average and state proficiency test score (measure of general competence used in Tennessee) were related with leadership and personal development ability with correlations of r = .31 and r = .45 respectively. These two correlations were significant at the .001 level. Socio-economic status, school activeness and total activeness had correlations with leadership and personal development ability of r = .19, r = .23 and r = .22 respectively with significance at the .001 level. Non-school activeness related to leadership and personal development ability with a correlation of r = .10 with a significance of .05.

CONCLUSIONS

1. Vocational agriculture students/FFA members possess more leadership and personal development abilities than non-vocational agriculture students.

2. Vocational agriculture students/FFA members from superior FFA chapters and vocational agriculture students/FFA members from non-superior FFA chapters possess about the same level of leadership and personal development ability.

3. Vocational agriculture students/FFA members from superior FFA chapters possess significantly more leadership and personal development abilities than non-vocational agriculture students.

4. Vocational agriculture students/FFA members from non-superior FFA chapters possess about the same level of leadership and personal development ability as non-vocational agriculture students from schools with superior FFA chapters.

5. Non-vocational agriculture students from schools that have superior FFA chapters possess significantly more leadership and personal development abilities than non-vocational agriculture students from schools that have non-superior FFA chapters.

6. The leadership and personal development abilities scores as measured in the study are far lower than that with which the profession can be pleased.

7. Students who are more active tend to develop higher levels of leadership and personal development ability.

8. Vocational agriculture students/FFA members from superior FFA chapters are more active in FFA activities than vocational agriculture students/FFA members from non-superior chapters.

9. Chapter activeness has a higher relationship to leadership and personal development abilities possessed by FFA members than activeness at district or regional, state and national levels.

RECOMMENDATIONS

1. In all sub-parts of the leadership and personal development ability criterion-referenced test, the scores were relatively low. This would imply there needs to be a critical review of the instructional process in teaching leadership and personal development abilities. Vocational agriculture instructors (FFA advisors) should establish instructional goals which include the teaching of leadership and personal development abilities. The teacher (FFA advisor) should develop methods and procedures which will increase the learning of leadership and personal development abilities.

2. It was found that activeness in the FFA increased the leadership and personal development abilities which students possessed. The FFA should be used as a vehicle to strengthen the availability of opportunities for students in vocational agriculture. Students should be encouraged to participate in as many activities as possible.

3. State Departments of Vocational Technical Education should consider developing a course of study (which would be distributed to the vocational agriculture instructors) which would include emphasis on leadership and personal development aibilities.

4. FFA advisors should guide the preparation of the FFA program of activities in order that it can funcation as it should. FFA advisors should make sure all members are on committees and performing their duties.

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Table 1

Comparison of the Four Groups of Students on Selected Variables

Variables	No. Cases	Ag Students/ Superior Chapters	No. Cases	Ag Students Non-Superior Chapters	No. Cases	Non-Ag Students/ Superior Chapters	No. Cases	Non-Ag Students/ Non-Superior Chapters	No. Cases	Total Mean Score
Socio-Economic Status[a]	(63)	25.93	(48)	24.35	(68)	26.18	(74)	26.58	(253)	25.89
High School Grade Point Average[b]	(63)	85.79	(49)	81.74	(67)	86.12	(74)	85.82	(253)	85.10
State Proficiency Test Score[c]	(44)	88.55	(44)	85.52	(56)	87.29	(32)	87.00	(176)	87.11
Non-School Activeness[d]	(65)	4.54	(50)	4.20	(69)	4.28	(73)	4.67	(257)	4.44
School Activeness[e]	(65)	4.86	(50)	4.52	(69)	4.81	(73)	5.43	(257)	4.94
Total Activeness[f]	(65)	9.32	(50)	8.72	(68)	9.07	(73)	10.10	(256)	9.36

[a] Low score was 13; high score was 40 with a range of 27. The score was derived by giving a weighted score to education level of head of house, family possessions and occupation of head of house and getting a total for the three areas. There was no significant difference between the four groups at the .05 level.

[b] Three and one-half year high school grade point average. Low score was 69; high score was 99 with a range of 31. The significance of F was .076.

[c] Low score was 46; high score was 100 with a range of 54. There was not a significant difference between the four groups at the .05 level.

[d] Low score was 0; high score was 16 with a range of 16. A weighted score was given to the extent of participation in each non-school activity, and a total of the activities was obtained. There was not a significant difference between the four groups at the .05 level.

[e] Low score was 0; high score was 20 with a range of 20. A weighted score was given to the extent of participation in each school activity, and a total of the activities was obtained. There was not a significant difference between the four groups at the .05 level.

[f] Low score was 0; high score was 29 with a range of 29. The total activeness score was obtained by adding the non-school and school activeness score of each individual student. There was not a significant difference between the four groups at the .05 level.

Table 2

Analysis of Covariance with Test Score As Dependent Variable and High School Grade Point Average as Covariate

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F
Covariate (HSGPA)	3709.74	1	3709.74	31.76	0.001
Treatment--Main Effects (Group)	6411.02	3	2137.01	18.30	0.001
Residual (Error)	28963.94	248	116.79	21.66	
Total	39084.70	252	155.10		

Note. Sixty-six question criterion referenced test score measuring leadership and personal development abilities.

Table 3

Analysis of Covariance with Post Hoc Analysis
Using the Scheffe Test on the Adjusted Test Scores
With High School Grade Point Average as the Covariate

	Ag Students/ Superior Chapters (Group 1)	Ag Students/ Non-Superior Chapters (Group 2)	Non-Ag Students/ Superior Chapters (Group 3)	Non-Ag Students/ Non-Superior Chapters (Group 4)
Number	65	50	69	74
Adjusted Mean Test Score	39.38	37.80[a]	32.93	26.78

Note. Sixty-six question criterion-referenced test score measuring leadership and personal development abilities.

[a] Means not connected by a common underline differ significantly at the .05 level.

Table 4

Relationship Between Level of Leadership and Personal Development Ability and Activeness in the FFA

Groups	Chapter Activeness	District/ Regional Activeness	State Activeness	National Activeness	Total FFA Activeness
Test Score of all Vo-Ag/FFA Students[a]	0.48	0.43	0.39	0.07	0.48
Significance	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p = 0.227$	$p < 0.001$
Superior FFA Chapters Test Score[b]	0.48	0.47	0.47	0.11	0.52
Significance	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p = 0.189$	$p < 0.001$
Non-Superior FFA Chapters Test Score[c]	0.46	0.33	0.16	-0.16	0.37
Significance	$p < 0.001$	$p = 0.009$	$p = 0.139$	$p = 0.130$	$p = 0.004$

Note. Sixty-six question criterion-referenced test measuring leadership and personal development abilities.

[a] $N = 115$.

[b] $N = 65$.

[c] $N = 50$.

Table 5

Relationship of Level of Leadership and Personal Development Ability with Selected Variables

	Socio-Economic Status	High School Grade Point	State Proficiency Test Score	Non-School Activeness	School Activeness	Total Activeness
Test Score of all Students Grouped Together (N = 258)	0.19	0.31	0.45	0.10	0.23	0.22
Significance	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p = 0.053$	$p < 0.001$	$p < 0.001$
Ag Students/Superior Chapters Total Score (Group 1: N = 65)	0.40	0.31	0.53	0.10	0.39	0.35
Significance	$p < 0.001$	$p = 0.008$	$p < 0.001$	$p = 0.210$	$p < 0.001$	$p < 0.001$
Ag Students/Non Superior Chapters Total Score (Group 2: N = 50)	0.12	0.31	0.38	0.12	0.13	0.18
Significance	$p = 0.204$	$p = 0.017$	$p = 0.006$	$p = 0.202$	$p = 0.183$	$p = 0.113$
Non-Ag Students/Superior Chapters Total Score (Group 3: N = 69)	0.23	0.43	0.47	0.20	0.35	0.34
Significance	$p = 0.029$	$p < 0.001$	$p < 0.001$	$p = 0.054$	$p = 0.002$	$p = 0.002$
Non-Ag Students/ Non-Superior Chapters Test Score (Group 4: N = 74)	0.26	0.53	0.74	0.07	0.19	0.17
Significance	$p = 0.012$	$p < 0.001$	$p < 0.001$	$p = 0.281$	$p = 0.054$	$p = 0.082$

Note. Sixty-six question criterion referenced test measuring leadership and personal development abilities.

Note. Pearson Correlation Coefficients.

JOB PLACEMENT AS INFLUENCED BY THE AGRICULTURAL BACKGROUND OF VOCATIONAL AGRICULTURE GRADUATES

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INTRODUCTION

Vocational agriculture is the part of the curriculum of many high schools designed to provide students with knowledge and skills needed for entry into agricultural occupations. Calhoun and Finch (1976) suggested that contemporary vocational agriculture programs should focus on preparation and advancement in any occupation involving knowledge and skill in agriculture. Historically, supervised occupational experience programs (SOEPs) have been an important component of vocational agriculture programs. The SOEPs should be designed to prepare students for job placement in either farming or off-farm agricultural occupations (Binkley and Tulloch, 1981). Vocational agriculture instructors have recognized the performance of tasks by their students in a supervised agricultural environment outside the classroom as a means of providing individualized learning in agriculture (Williams, 1978). Burdine (1978) suggested that a good SOEP can help bridge the gap between school life and the world of work by blending meaningful job experiences with related educational courses. Rawls (1977) also concluded that it is important that the SOEP and other components of the vocational agriculture program be geared toward preparing students with occupational and vocational plans for entering employment after graduating from high school.

Agricultural educators have suggested that a positive relationship should exist between the agricultural background of the vocational agriculture graduate and job placement. Therefore, the lack of data to document the relationship of the agricultural background of students to job placement in Missouri became the focal point of this study.

OBJECTIVES OF THE STUDY

The primary objective of this study was to identify the relationship between job placement of Missouri high school seniors, graduating in 1977, who studied vocational agriculture and the following student variables: (1) type of SOEP; (2) type of agricultural background prior to high school; (3) current level of education; (4) number of SOEP supervisory visits during the senior year; (5) growth of the SOEP from the freshman year to the senior year in high school; (6) change in net income from SOEP between the freshman and the senior year in high school; and (7) scope of the SOEP the senior year in high school.

The following null hypotheses were formulated and tested at the .05 alpha level:

Ho_1: There is no significant relationship between the type (ownership or placement) of supervised occupational experience programs of vocational agriculture students and their first and fifth year job placement.

Ho_2: There is no significant relationship between the type of agricultural background prior to high school of vocational agriculture students and their first and fifth year job placement.

Ho_3: There is no significant relationship between the level of education completed by the vocational agriculture students and their fifth year job placement.

Ho_4: There is no significant relationship between the number of senior year supervisory visits to the vocational agriculture students and first and fifth year job placement.

Ho_5: There is no significant relationship between the growth of the vocational agriculture students' supervised occupational experience program and their first and fifth year job placement.

Ho_6: There is no significant relationship between the amount of change in net income received from the vocational agriculture students' supervised occupational experience program and their first and fifth year job placement.

Ho_7: There is no significant relationship between the scope of the students' supervised occupational experience program and their first and fifth year job placement.

METHODS AND PROCEDURES

The population for this study consisted of 3,500 senior students from Missouri high schools with programs of vocational agriculture in 1975 through 1982. The sample was drawn based on the 3,500 senior students who took vocational agriculture in 1977. Thirty schools were randomly selected from the 234 schools offering vocational agriculture to obtain the needed sample size of 346 students which would be representative of the population at the .05 level. (Ninty-four students would have been needed at the .10 level.) Only students with completed SOEP records for both 1975 and 1977 were included in the sample. The size of this sample was selected according to procedures suggested by Krejcie and Morgan (1970).

The design of the study was ex post facto in nature because it was not possible to exert direct control over the independent variables. Job placement was identified as the dependent variable. Responses were categorized as full-time agriculture, part-time agriculture, or other placement.

Data were collected from records in the Missouri Department of Elementary and Secondary Education and by a mailed questionnaire. The questionnaire was designed to collect data about the first and fifth year job placement of the graduates. The validity of the instrument was checked by a panel of experts in Agricultural Education at the University of Missouri-Columbia. In addition, a field test was conducted with graduates from a Missouri high school not selected for the study. Based on the results of the field test, the procedures and instrument were judged to be workable.

There were 350 questionnaires mailed to the vocational agriculture instructors of the selected schools with a request that they be delivered to the vocational agriculture graduates. Two-hundred-thirty questionnaires were delivered to graduates and five graduates were reported as deceased. Questionnaires were returned by 78 graduates. A mail and a telephone follow-up was made to each teacher. The 35 percent return from those receiving a questionnaire became a limitation of the study. Therefore, a phone survey of the non-respondents was taken to see if there was a significant relationship between respondents and non-respondents. Sixteen (10 percent) randomly selected graduates that had not responded were contacted by telephone and data were collected. Chi-square values of .0172 and .7163 were calculated comparing the responses given by the respondent and non-respondent groups as to their type of job placement one and five years after graduation. The data showed both groups to have similar response patterns.

The data were analyzed using chi-square tests for independence. When the expected cell sizes were small, Yates' correction for continuity was used as necessary. Null hypotheses were tested for significance at the .05 alpha level.

RESULTS

The data were analyzed by use of chi-square tests. Table 1 presents the results of the analysis.

Null hypothesis 1 was rejected. Significant relationships were found between the type (ownership and placement) of SOEPs of vocational agriculture students and fifth year job placement. Those graduates who had ownership types of SOEPs in high school vocational agriculture were more likely to be engaged in full-time agricultural occupations. Those graduates who had placement types of SOEPs in high school vocational agriculture were more likely to be engaged in occupations not related to agriculture.

Null hypothesis 2 was rejected. Significant relationships were found between the type of agricultural background prior to high school of vocational agriculture graduates and first and fifth year job placements. Those graduates who had farm backgrounds prior to entering high school were more likely to be engaged in full-time agricultural occupations. Those graduates who did not have farm backgrounds prior to entering high school were more likely to have jobs not related to agricultural occupations.

Null hypothesis 3 was rejected. Significant relationships were found between the level of education completed by the vocational agriculture graduates and their fifth year job placement. Those graduates who had a high school education were more likely to be engaged in full-time agricultural occupations. Those graduates who had completed other types of educational programs beyond high school (technical, community college, four year college, etc.) were more likely to be engaged in part-time agricultural occupations and in occupations not related to agriculture.

Table 1

Chi-Square Values by Variables for First
and Fifth Year Job Placement

	First Year Placement		Fifth Year Placement	
Variable	N	x^2	N	x^2
Type of SOEP	73	2.17	70	8.11[a]
Agricultural background	76	14.05[a]	73	10.57[a]
Level of education	--	------	73	17.46[a, c]
Number of SOEP visits	72	1.86	69	.67
Growth of SOEP	71	3.76	69	5.47
Change in net income	71	12.25[b]	69	1.77
Scope of SOEP	71	3.71	69	6.950[c]

a for df = 2, P .05 $\geq$ 5.99
b for df = 4, P .05 $\geq$ 9.49
c calculated with Yates' correction for continuity

Null hypothesis 4 was not rejected, indicating no significant relationship between the number of senior year supervisory visits made by the high school vocational agriculture instructor and first and fifth year job placements of the graduates.

Null hypothesis 5 was not rejected, indicating no significant relationship between the growth of the vocational agriculture graduates' SOEP and first and fifth year job placements.

Null hypothesis 6 was rejected. Significant relationships were found between the amount of change in net income received from the vocational agriculture graduates' SOEP and their first year job placement. Those graduates who had a net income in the top third of the group were more likely to be engaged in either full-time or part-time agricultural occupations. Those graduates who had a net income in the middle or bottom third of the group were more likely to have jobs not related to agricultural occupations.

Null hypothesis 7 was not rejected. No significant relationships were found between the scope of the vocational agriculture graduates' SOEP and their job placement.

DISCUSSION

Professionals in agricultural education must continually seek ways to improve the programming. Caution should be used in examining the findings of this study because of the response rate. However, based on the similarity of responses from respondents and non-respondents, the following implications may be suggested.

Those students with ownership types of SOEPs were more likely to be engaged in full-time agricultural occupations than those who had placement types of SOEP. Therefore, it seems that if the percentage of vocational agriculture students entering full-time agricultural employment in Missouri is to be increased, schools need to find ways, such as providing facilities and support, for more students to have ownership SOEPs or to increase the quality and relevance of placement types of SOEPs. Teachers must not write off students with small SOEPs, but should do those things that will provide all students opportunities that will increase their interest in and enhance their likelihood to enter agricultural employment.

Students who had farm backgrounds prior to entering high school were more likely to be engaged in agricultural occupations. Therefore, teachers must also find ways to better prepare and/or increase the desire of non-farm students to enter into agricultural employment. SOEPs for students with non-farm backgrounds can be a vehicle for equalizing opportunities and increasing the likelihood that these students will enter agricultural employment.

Graduates having only a high school education were more likely to be engaged in full-time agricultural occupations than were graduates completing education beyond high school. If a most favorable reflection of vocational agriculture is to be received from the agricultural community, schools must endeavor to insure that those students not planning formal education beyond high school are well equipped to enter the agricultural field. It is also important that those individuals going directly from high school into agricultural employment have an opportunity to participate in adult education programs related to their employment.

If all students are to receive the greatest benefit from studying vocational agriculture, teachers, supervisors, and teacher educators must work to improve our programming. Specifically, one challenge is to provide SOEPs developed to meet the individual needs and backgrounds of each student enrolled in vocational agriculture to aid them in developing the competencies needed for job placement in an agricultural occupation.

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A STUDY OF HORTICULTURAL PROGRAMS IN WHICH SPECIAL NEEDS STUDENTS ARE ENROLLED

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Abstract

Title: A Study of Horticultural Programs in Which Special Needs Students are Enrolled

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Introduction:

Through federal funding, special facilities and classes have been implemented specifically for the instruction of the special needs student. Horticulture is one such program that has become available to the educable student as a result of these federal funds. Through the horticultural program, the EMR student can learn and develop competencies which could be applicable to employment opportunities.

Unfortunately, with inflationary trends, school districts have been forced to cut programs. Special need services have become part of these cutting measures. As a result, special needs students have been mainstreamed into regular programs.

This change from special needs classes to mainstreaming into regular programs causes one to question whether the special needs program is, indeed, viable or necessary. This study is needed to identify the differences, if any, between a secondary level special needs horticultural program and a mainstreamed horticultural program.

Objectives of the Study:

The objective of study was to identify the facilities, teaching techniques, and teaching strategies used to meet the needs of special education students mainstreamed into the regular horticultural programs. To narrow the study, it focused specifically on the educable mentally retarded and learning disabled students. The study sought to determine if secondary horticultural programs are adapting to the mainstreamed students and what adaptations in teaching styles are taking place.

The specific objectives of the study were to answer the following research questions:

- Does mainstreaming provide adequate education and training for the educable mentally retarded and/or learning disabled students to meet competency requirements in horticulture?
- What special training, if any, is provided for the educable mentally retarded or learning disabled students in a mainstreamed situation?
- What training or education, if any, do teachers receive to work with educable mentally retarded or learning disabled students in a mainstreamed situation?

Methodology:

A questionnaire consisting of twenty-nine items were constructed for use in this study. A committee consisting of university faculty members reviewed the instrument to determine construct validity. The committee was comprised of persons with expertise in horticulture, research, and special education at the secondary level. Upon approval of the questionnaire, it was mailed to all horticulture teachers identified in the Directory of Vocational Agriculture Teachers in Pennsylvania. A letter explaining the study and an addressed, no-postage envelope accompanied the questionnaire. Two weeks after the initial mailing, a follow-up letter was mailed to those teachers who had not responded. The total responses generated a 60 percent return rate with the total number of teachers being 79. The returned questionnaire information were coded and key punched for computer analysis.

Results:

The results of this study were very interesting. The majority of teachers indicated that they had no education or training to work with any special needs students. Some of these teachers indicated that they had been teaching on an average of four years or more. As indicated by the teachers, local school districts are not providing inservice classes to help prepare teachers to effectively work with special needs students. However, horticulture teachers did report several services available to assist them. These included 1) academic special needs teachers, 2) intermediate unit personnel, 3) guidance staff, and (4) the use of individualized education programs materials.

Teachers in this study were also asked to rank a list of services or activities to help them be more effective. They ranked teacher aides as the number one item. The feeling was that aides could help provide the individual attention needed in many situations. Item ranked number two was the offering of inservice courses and workshops to learn more about how to better serve the needs of this special population. Three other items also emerged as being important in helping horticulture teachers to serve the needs of these special students. They are 1) availability of background information on each student, 2) availability of personnel to respond effectively to concerns of teachers, and 3) workshops or college courses addressing the teaching of educable mentally retarded and learning disabled students.

Teachers of horticulture also had strong feelings about help with the instructional program. Generally, they felt that high priority should be placed on the use of filmstrips/tapes appropriate for EMR/LD students, competencies or tasks written especially for this population along with textbooks or manuals in large bold-face print. Additionally, the reading level of most written materials is too high for EMR/LD students. Microcomputers ranked very low in this category.

In the subject-matter area, it was felt that greenhouse crop production was the most important area of concern in teaching EMR/LD students enrolled in Horticulture. Teachers of horticulture emphasized that a manual especially designed for special needs students was needed. Other areas of horticulture was also mentioned as being important and in need of appropriate instructional materials. Many teachers felt that the learning would be more effective in a special setting while professing that hands-on experiences and demonstrations have proved to be effective teaching strategies.

Conclusion:

Based on the finding of this study, teachers of horticulture are experiencing a lot of anxiety in trying to serve the needs of educable mentally retarded and learning disabled students. This is partly due to the lack of preparation on their part and on the part of local school administration, state school administration, and teacher preparation programs at the universities and colleges. Teachers of horticulture are receiving little, if any, inservice classes to help them become more effective with special needs students. Additionally, the burden of modifying or developing instructional materials to aid in teaching these students rest, thus far, on the shoulders of these teachers who are not adequately prepared to solve other problems that they are having.

The data indicates that teachers of horticulture are looking for help to improve their abilities in the pedagogical areas. Teaching strategies and techniques are needed by these teachers. In addition, appropriate instructional materials are needed. These materials should have the appropriate reading level, concepts should be well explained, and the overall structure should be appropriate for educable mentally retarded/learning disabled student. These small things will help reduce the frustration of excellent teachers striving to do an effective job in teaching special needs students.

Educational Importance:

This study has helped problems of horticulture teachers to emerge and become items of concern for both school administrators and teacher educators. School administrators must take a closer look at the effectiveness of the mainstreaming system, paying close attention to the assistant provided and used by teachers of students mainstreamed into the regular classroom. Enough data have been gathered in the study to pinpoint areas where modifications are needed and where teachers have concerns.

Teacher education programs at both the colleges and universities should be reviewed and evaluated in light of the concerns raised in this study. Teacher educators and teacher preparation programs should broaden the scope of the traditional program and provide the necessary education and training needed by new teachers to effectively serve the needs of the special learner. In short, school administrators and teacher educators should ask themselves if their programs are effective and if they need to be revised.

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A STUDY OF HORTICULTURAL PROGRAMS IN WHICH SPECIAL NEEDS STUDENTS ARE ENROLLED

Introduction:

It was not until the passage of Public Law 94-142 that proper attention was given to the education of our handicapped population. According to Cartwright, Cartwright and Ward (1981), efforts to focus proper attention on the handicapped population occurred as far back as 1843 with Dorothea L. Dix. She crusaded for human rights, presented moving speeches, and implored the legislature to concern itself with the plight of "insane and idiotic persons" (p. 2). Through her efforts and those efforts of her followers, proper and needed attention has improved the situation of handicapped persons.

In 1975, Congress passed into law the Education of All Handicapped Children Act (P.L. 94-142). This Act mandated that all physically, mentally, and emotionally and sensory handicapped children be provided with the opportunity to receive a free appropriate public education (Simonson, 1980, p. 1). This Act was reinforced and expanded with the passage of the Education Amendment of 1976 (P.L. 94-482). The 1976 Act defined the different handicap categories with emphasis on those persons who require special education and related services and because of their handicapping condition cannot succeed in the regular vocational education program without special assistance. Congress also allocated over 500 million dollars to educational agencies to operate programs for the handicapped population (Simonson, 1980, p. 1).

In addition to the aforemention legislation, the Vocational Rehabilitation Act of 1973, Section 503 and 504 guaranteed that all handicapped persons shall have equal access to all programs, jobs, and housing (Cartwright, Cartwright, and Ward, 1981, p. 3). Thusly, educators were legally bound by law to open up their facilities and programs to the handicapped.

As the need for vocational training became more recognized, more tax dollars were invested in vocational programs. Likewise, vocational educators were held increasingly accountable for their actions in meeting the needs of the handicapped.

Much effort has gone into meeting the needs of the handicapped population. Greenwood and Morley (1978) conducted a survey of vocational administrators and identified inservice education as their most important activity to improve programs and services for handicapped students. Another finding that emerged from this study was the lack of education and training of certified teachers to work with handicapped learners.

Through federal funding, special facilities and classes have been implemented specifically for the instruction of the special needs student. Horticulture is one such program that has become available to educate these students as a result of these federal funds. Through the horticultural program, the EMR/LD student can learn and develop competencies which could be applicable to employment opportunities.

Unfortunately with inflationary trends, school districts have been forced to cut programs. Special needs services have become part of these cutting measures. As a result, special needs students have been mainstreamed into regular programs.

This change from special needs classes to mainstreaming into regular programs causes one to question whether the special needs program is, indeed, viable or necessary. This study was needed to identify the differences, if any, between a secondary level special needs horticultural program and a mainstreamed horticultural program.

Objectives of the Study:

The objective of study was to identify the facilities, teaching techniques, and teaching strategies used to meet the needs of special education students mainstreamed into the regular horticultural programs. To narrow the study, it focused specifically on the educable mentally retarded and learning disabled students. The study sought to determine if secondary horticultural programs are adapting to the mainstreamed students and what adaptations in teaching styles are taking place.

The specific objectives of the study were to answer the following research questions:

- Does mainstreaming provide adequate education and training for the educable mentally retarded and/or learning disabled students to meet competency requirements in horticulture?
- What special training, if any, is provided for the educable mentally retarded or learning disabled students in a mainstreamed situation?
- What training or education, if any, do teachers receive to work with educable mentally retarded or learning disabled students in a mainstreamed situation?

Methodology:

To accomplish the objectives, an expost facto design was chosen. A questionnaire containing twenty-nine items was constructed and used in this study. A committee consisting of university faculty members reviewed the questionnaire to determine content validity. The committee was comprised of persons with expertise in horticulture, research, and special education at the secondary level. Upon approval of the questionnaire, it was mailed to all horticulture teachers identified in the Directory of Vocational Agriculture Teachers in Pennsylvania (Scanlon, 1982). A letter explaining the study and an addressed, no-postage envelope accompanied the questionnaire. Two weeks after the initial mailing, a follow-up letter was mailed to those teachers who had not responded. The total responses generated a 57.7 percent return rate with the total number of teachers being 78. The returned questionnaire information were coded and computer analyzed.

Results;

The findings of this study will be discussed in two parts, biographic data and data embracing the objectives. Since this was primarily a descriptive study using an expost facto design, no attempt was made to use inferential statistics.

Teachers responding to the questionnaire reported educational experience beyond the high school level. Although a person with a minimum of three years of documented wage earning trade experience and successful completion of a comprehensive trade examination irregardless of education background may teach, only two teachers reported having less than a baccalaureate degree. There were two teachers who reported having a doctoral degree. Further details on the education levels are shown in Table 1.

Table 1

Educational Levels of Horticultural Teachers

Degree	No. of Teachers[a]	Percent
Met only Certification Requirements	2	4.4
Associate Degree	0	0
Bachelor Degree	29	64.4
Masters Degree	12	26.7
Doctoral Degree	2	4.4

[a] n = 45

Horticultural Programs are generally available to several grade levels at both the comprehensive high schools and the area vocational technical schools (AVTS). The majority of the teachers in this study taught students in grades ten, eleven, and twelve. As shown in Table 2, all horticultural teachers responding to the questionnaire taught grades eleven and twelve and 82 percent taught grade ten. Only about 18 percent taught grade nine.

Table 2

Grade Level Taught by Horticultural Teachers

Grade	No. of Teachers	Percent
Nine	6	17.7
Ten	37	82.2
Eleven	45	100
Twelve	45	100

Generally, years of teaching experience was relatively the same among all horticultural teachers. There were no first year teachers responding to the questionnaire. However, there were ten teachers with less than three years of teaching experience, although the majority of teachers (77.8%) reported four or more years of experience (see Table 3).

Table 3

Years of Teaching Experience

No. of Years Experience	No. of Teachers[a]	Percent
Less Than One Year	0	0
One to Three Years	10	22.2
Four or More Years	35	77.8

[a] n = 45

With the majority of the teachers having four or more years of teaching experience, it is very understandable that the average age of male teachers was 40 and female teachers, 30.2. Male teachers accounted for 81.2 percent of the responding teachers.

According to the data in Table 4, the majority of teachers indicated that they had no education or training to work with any special needs students. Some of these teachers indicated that they had been teaching on an average of four years or more. As indicated by the teachers, local school districts are not providing inservice classes to help prepare teachers to effectively work with special needs students. However, horticulture teachers did report several services available to assist them. These services included 1) academic special needs teachers, 2) intermediate unit personnel, 3) guidance staff, and 4) the use of individualized education programs materials.

Table 4

Concerns in Teaching EMR/LD Students

Concerns	Response	Number of Teachers[a]	Percent
Had instruction specific for teaching EMR/LD students	Yes	14	31.2
	No	31	68.8
Inservice education offered	Yes	12	26.7
	No	33	73.3
Services provided to teacher:			
Academic special needs teacher	Yes	15	33.3
Intermediate unit personnel	Yes	21	46.7
Guidance counselor	Yes	24	53.3
I.E.P.	Yes	9	20.0
Student background information	Yes	15	33.3

[a] n = 45

Teachers in this study were also asked to rank a list of services or activities needed to help them be more effective (see Table 5). They ranked teacher aides as the number one item. The feeling was that aides could help provide the individual attention needed in many situations. Item ranked number two was the offering of inservice courses and workshops to learn more about how to better serve the needs of this special population. Three other items also emerged as being important in helping horticulture teachers to serve the needs of these special students. They are 1) availability of background information on each student, 2) availability of personnel to respond effectively to concerns of teachers, and 3) workshops or college courses addressing the teaching of edudable mentally retarded and learning disabled students.

Table 5

Rankings of Types of Assistance Felt to Aid the Effective Teaching of EMR/LD Students

Items	No. of Teachers[a]	Percent Ranking
Teacher Aide	32	71.1
Inservice Workshops	24	53.3
Background Information	20	44.4
Special Needs Specialists	15	33.3
Higher Education Workshops or Courses	14	31.1
Private Groups or Associations	4	8.9

[a] n = 45

Teachers of horticulture also had strong feelings about help with the instructional program. Generally, they felt that high priority should be placed on the use of filmstrips/tapes appropriate for EMR/LD students, competencies or tasks written especially for this population along with textbooks or manuals in large bold-face print. Additionally, the reading level of most written materials is too high for EMR/LD students. Microcomputers ranked very low in this category.

In the subject-matter area, it was felt that greenhouse crop production was the most important area of concern in teaching EMR/LD students enrolled in horticulture. Teachers of horticulture emphasized that a manual especially designed for special needs students was needed. Other areas of horticulture was also mentioned as being important and in need of appropriate instructional materials (see Table 6). Many teachers felt that the learning would be more effective in a special setting while professing that hands-on experiences and demonstrations have proved to be effective teaching strategies.

Table 6

Ranking of Subject Matter Areas of Horticulture
Felt to be Most Appropriate for EMR/LD Students

Subject Matter Area	No. of Teachers[a]	Percent Ranking
Greenhouse Crop Production	37	82.2
Floriculture	21	46.7
Landscape Design/Maintenance	18	40.0
Turfgrass/Maintenance	17	37.8
Small Engine Repair/Maintenance	15	33.3
Vegetable/Fruit Production	14	31.1

[a] n = 45

Conclusions:

Based on the finding of this study, teachers of horticulture are experiencing a lot of anxiety in trying to serve the needs of educable mentally retarded and learning disabled students. This is partly due to the lack of preparation on their part and on the part of local school administration, state school administration, and teacher preparation programs at the universities and colleges. Teachers of horticulture are receiving little, if any, inservice classes to help them become more effective with special needs students. Additionally, the burden of modifying or developing instructional materials to aid in teaching these students rest, thus far, on the shoulders of these teachers who are not adequately prepared to solve other problems that they are having.

The data indicates that teachers of horticulture are looking for help to improve their abilities in the pedagogical areas. Teaching strategies and techniques are needed by these teachers. In addition, appropriate instructional materials are needed. These materials should have the appropriate reading level, concepts should be well explained, and the overall structure should be appropriate for educable mentally retarded/learning disabled student. These small things will help reduce the frustration of excellent teachers striving to do an effective job in teaching special needs students.

Educational Importance:

This study has helped problems of horticulture teachers to emerge and become items of concern for both school administrators and teacher educators. School administrators must take a closer look at the effectiveness of the mainstreaming system, paying close attention to the assistant provided and used by teachers of students mainstreamed into the regular classroom. Enough data have been gathered in the study to pinpoint areas where modifications are needed and where teachers have concerns.

Teacher education programs at both the colleges and universities should be reviewed and evaluated in light of the concerns raised in this study. Teacher educators and teacher preparation programs should broaden the scope of the traditional program and provide the necessary education and training needed by new teachers to effectively serve the needs of the special learner. In short, school administrators and teacher educators should ask themselves if their programs are effective and if they need to be revised.

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A DISCUSSION OF RESEARCH RELATING TO SOE

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RELATIONSHIP OF SOE IN AGRICULTURE AND ESTABLISHMENT IN OCCUPATIONS

Findings

This study addresses an issue that is important to the total agricultural education profession. The researchers are to be commended for selecting an appropriate and timely problem for study. It is extremely important to have follow-up information especially five to six years or more following graduation or program completion. Most Vocational Agriculture teachers and supervisors of agricultural education would consider the findings of this study to be valuable for making curriculum decisions and developing long-range program goals.

Strengths

As previously mentioned there is a need for the information presented in this study. The study is also designed to build upon the information developed and presented in a previous study by McMillion and Auville. The significance of the problem to vocational agriculture makes this study valuable to the profession.

Suggestions for Improvement

This study presents some interesting considerations for the reviewer. A major concern with a survey of this type is external validity. That is to what groups can we generalize the results of the study. It is generally realized that there are three potential threats to external validity: (1) sampling bias, (2) non-response and (3) measurement error. This study provides an opportunity to look at all three threats.

We begin with a stratified random sample of 185 students in Production Agriculture programs in Virginia--no sampling bias. We then find that 32 of the 185 students cannot be located--sampling bias begins to creep in. The question then arises about whether or not generalizations of the results can be made back to Production Agriculture students in Virginia.

Of the remaining 153 students only 68 percent responded. Non-response now becomes a threat. If we assume that only 104 students out of 185 constitute the sample, then we can see that the response rate is really only 56%--a rather substantial threat to external validity. Therefore, it becomes very risky to say this sample is truly representative of the 185 students and that the results can be generalized back to Production Agriculture students in Virginia.

Measurement error is a problem when an instrument either does not measure what it is supposed to measure or it measures it incorrectly. The authors show their awareness of this problem by stating that they conducted a test for reliability. However, they do not report what the reliability was. If it is low, then it is very possible that administering the instrument to the individuals again would produce different results. There is also no mention of a check for content validity--another potential source of measurement error.

VOCATIONAL AGRICULTURE TEACHER CHARACTERISTICS AND THEIR RELATIONSHIP TO PERCEPTIONS OF SOE IMPORTANCE, ATTITIUDES TOWARD SUPERVISION AND QUALITY OF SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

Findings

This study looks at teacher perceptions of SOE in Areas I and II of Texas. The issue of quality in relation to SOE programs is an important one that can tell us much about our programs. Teachers, supervisors and teacher educators need a common definition of what constitutes a quality SOE. The researchers contend that their findings indicate teachers in Areas I and II of Texas are supervising occupational experience programs to a greater extent than that reported in other recent studies seems inconsistent with studies conducted in New Mexico, Colorado and Utah which indicate that over 80 percent of the students in these states have SOEPs.

Strengths

This study is another example of research that addresses a significant problem relating to Vocational Agriculture. The researchers are to be commended for their checks on the reliability and validity of the instruments used. These areas are often ignored in studies. The return rate was very good and the followup of non-respondents was excellent.

Suggestions for Improvement

Without more information concerning the reliability and validity of the formula used to calculate a quality score for each department's SOE, I am hesitant to accept the researchers' conclusions that quality can be determined by the formula. It is true the formula measures something. Whether or not it measures quality is a question that has not been answered by this study.

FACTORS ASSOCIATED WITH SUPERVISED OCCUPATIONAL EXPERIENCE IN CALIFORNIA VOCATIONAL AGRICULTURE PROGRAMS

Findings

This study constitutes a portion of a regional project developed in the Western states to determine the status of supervised occupational experience programs. Other studies conducted in the west include those in New Mexico, Utah and Colorado. This study indicates that a relationship exists between FFA membership and student participation in SOEP and poses some interesting questions for further study. Factors are also identified that are associated with programs that had 75 percent or more students with SOEP.

Strengths

A major strength of this study is its contribution to a regional effort to conduct research on a problem of significance to the agricultural education profession. This study provides a good example for researchers to follow. It addresses a problem of importance, the research methodology and techniques are very good, the conclusions are appropriate and the recommendations are challenging.

It provides information that can be used by teachers in California to evaluate their SOE programs in comparison to state-wide SOE information. It also identifies factors that can be used by supervisors in establishing policies and plans for improving SOE in California. Teacher education can benefit both from the standpoint of preservice and inservice ideas gained from this study. The suggestions for further research including utilization of composite variables in similar studies should also contribute to research improvement by teacher education. The finding regarding composite variables might also indicate that teachers' overall attitude and job satisfaction, based on their perceptions of school and community support, have a positive influence on developing SOEPs.

VIRGINIA
TECH

A FOLLOW-UP STUDY TO DETERMINE THE RELATIONSHIP BETWEEN HIGH SCHOOL SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS IN AGRICULTURE AND ESTABLISHMENT IN OCCUPATIONS

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INTRODUCTION

Supervised occupational experience programs in vocational agriculture include both experience programs for students preparing for farming and experience programs for students preparing for non-farm occupations requiring knowledge and skill in agriculture. Although the importance of the supervised occupational experience program is widely accepted by agricultural educators, there has been little research conducted which provides evidence that such programs aid students after graduation from high school.

Most of the existing follow-up studies in vocational agricultual education examined the occupational status of former students one to two years following graduation from high school. These studies sought to find relationships between the total program of vocational agriculture and the occupational status of former students. This study was undertaken to seek relationships between a portion of the vocational agriculture curriculum, the supervised occupational experience program, and the establishment in occupations of former students five to six years following high school graduation.

Need

There has been a decline in the number of students enrolled in vocational agricultural education who participate in the supervised occupational experience program. Lee (1980) stated that "our profession is fearful that the supervised occupational experience program is slipping away and without it we would have lost one of the great pillars on which vocational education in agriculture/agribusiness has been built." Iverson (1980) found that 40 percent of the 1974 vocational agriculture graduates in 13 Southern states failed to carry out a supervised occupational experience program during each year that they were enrolled in school.

It is contended here that this decline was due, in part, to a lack of support by educators at all levels of the supervised occupational experience program. This lack of support may have existed because not enough research has been undertaken to provide evidence as to the value of such a program. Lee (1980) stated that "we must conduct significant research which documents the role of supervised occupational experience in our program." According to Warmbrod and Phipps (1966:55), "programs of supervised experience in agriculture have been justified philosophically and educationally but research efforts supporting these justifications have been meager." In essence, more evidence of the value of supervised occupational experience programs, particularly in aiding graduates to become established in occupatoins over a period of time, was needed to further document the role of this program in vocational agricultural education.

OBJECTIVES OF THE STUDY

The primary purpose of this study was to determine whether the supervised occupational experience programs of former production agriculture students were related to establishment in an occupation. The following null hypotheses were formulated for the purposes for this study and tested at the .05 probability level:

Ho1 The present employment status of the former students is independent of their Farming Program Scores.

Ho2 The present job of the former students is independent of their Farming Program Scores.

Ho3 The first job of the former students is independent of their Farming Program Scores.

Ho4 There is no relationship between the number of job changes made by the former students and their Farming Program Scores.

Ho5 The yearly income of the former students is independent of their Farming Program Scores.

Ho6 There is no relationship between the years of education of the former students and their Farming Program Scores.

Ho7 There is no relationship between the perceptions of the supervised occupational experience program held by the former students and their Farming Program Scores.

METHODS AND PROCEDURES

Data Base Study

The research which provided the data base for this study was conducted by McMillion and Auville in 1976. That research was conducted to determine the factors related to the success of supervised farming programs of production agriculture students in Virginia and to identify those factors which contribute to significant variability in the quantity in a supervised farming program.

The population consisted of the Virginia schools in the 1975-76 school year whose departments of vocational agriculture offered agricultural production. Twenty-four schools, four from each of the six supervisory areas in Virginia, were selected using a stratified random sampling procedure. Only juniors or seniors who were students of their agricultural production teacher for the two previous years of instruction were included. Thus, a total of 185 students constituted the sample.

To evaluate the supervised farming programs, the value of land, buildings and equipment, labor income, and Productive Man Work Day

(PMWD) units were considered. Points were assigned according to the following specifications:

Value of land, buildings and equipment	1 point/$100 investment
Labor income	1 point/$100 income
PMWD 1975	1 point/5 PMWD units
Increase in PMWD's from 1974 to 1975	1 point/5 PMWD units

A grand total was calculated for each student to produce a Farming Program Score, the dependent variable in the study.

This study was a follow-up of the 185 students who participated in the research conducted by McMillion and Auville five to six years after graduation from high school. The dependent variable derived in that study, Farming Program Score, was used as the independent variable for this study.

Instrumentation

A two-part questionnaire was constructed to collect the data. One section of the questionnaire was used to obtain factual information and the other section for the measurement of the perceptions held by the former students of the supervised occupational experience program.

The fact-gathering portion of the questionnaire was used to collect the following data from each former student: (1) employment status, (2) present job, (3) first job, (4) number of jobs held, (5) yearly income, and (6) years of education.

The measurement of the perceptions held by the former students of the supervised occupational experience program, the second part of the questionnaire, was achieved using a five-point Likert-type or summated rating scale. Points were assigned to the scale in the following manner: strongly agree (five points); agree (four points); undecided (three points); disagree (two points); and strongly disagree (one point). The test-retest procedure was used to determine the reliability of the scale.

Data Collection and Analysis

The first step in collecting the data was locating the former students. Separate lists of the students and their addresses while in high school were complied from the 1973-74 and 1974-75 Future Farmers of America membership rosters. These lists were then mailed to the respective teachers of the former students who either verified the listed addresses as being valid or furnished new addresses where students had moved. In several instances, the teachers were not able to locate particular students but furnished, where possible, alternate information such as the name, address, and telephone number of a friend, relative, or place of employment of the former student. One hundred and fifty-three of the former students were located using this procedure.

Mailed questionnaires were used to collect the data. Three follow-ups -- a post card, a second questionnaire, and a telephone call -- yielded a response rate of 68 percent.

Null hypotheses numbers two, three, and five were tested using chi squate. A subsequent Gamma coefficient was used to measure the strength of association. Null hypotheses numbers four, six, and seven were tested using the Product-Moment Correlation (Pearson r). Hypothesis number one was not tested.

RESULTS

The majority of the former students were employed full time. Of the 103 respondents, 96 (93.2 percent) were employed full time, three (2.9 percent) were employed part-time and four (3.9 percent) were unemployed. A chi square was not computed for this hypothesis because the frequencies were not large enough to provide the necessary cell sizes. Therefore, the null hypothesis (the present employment status of the former students is independent of their Farming Program Scores) was neither rejected nor accepted.

Of the 103 respondents 36.9 percent were employed in agriculture and 10.7 percent were employed in agriculturally related jobs. The remainder of the respondents (50 percent) were employed in non-agricultural jobs. The Farming Program Scores were divided into three categories. The lower 33 1/3 percent of the scores were categorized as "low," the middle 33 1/3 percent as "medium," and the upper 33 1/3 percent as "high." A chi square was computed on the nature of the present job and the Farming Program Score. Results were significant at the .05 probability level (Table 1). The null hypothesis (the present job of the former students is independent of their Farming Program Scores) was rejected.

The Gamma coefficient, which expresses the measure of association between present job and Farming Program Score, was .5078. This coefficient indicated that the greater the Farming Program Score of the former student, the more likely he or she was employed in agriculture.

The first job of 56.3 percent of the former students was in agriculture. The other 42.7 percent of the former students obtained first employment outside of agriculture. Farming Program Scores were categorized as being low, medium, and high according to the lower, middle, and upper thirds. A chi square was computed on the nature of the first job and the Farming Program Score of the students. Results were significant at the .05 probability level (Table 2). The null hypothesis (the first job of the former students is independent of their Farming Program Score) was rejected.

Table 1

Chi Square for the Nature of the Present Job of the Former Students by Their Farming Program Scores

Farming Program Score		Number Employed in Agriculture	Number Employed in Other Occupations
High		25	9
Medium		14	21
Low		10	10
	Total	49	50

$X^2 = 12.254$, df = 2
significant at the .05 probability level

Table 2

Chi Square for the Nature of the First Job of the Former Students by Their Farming Program Scores

Farming Program Score		Number Employed in Agriculture	Number Employed in Other Occupations
High		25	10
Medium		21	15
Low		12	19
	Total	58	44

$X^2 = 7.224$, df = 2
significant at the .05 probability level

The Gamma coefficient (measure of association) between present job and Farming Program Score was .4201. This figure indicated that the greater the Farming Program Score of the student, the more likely his or her first job was in agriculture.

More than 74 percent of the former students had changed jobs since graduation. The mean number of jobs held by the respondents was 2.757. Twenty-eight percent of the former students had changed jobs twice since graduation from high school or college. About 25 percent of the respondents were still employed on their first jobs. A summary of the frequencies of jobs held is reported in Table 3. The correlation coefficient between the number of jobs held by the former students and their Farming Program Scores was r = -.027. Since this coefficient was not statistically significant at the .05 level, the null hypothesis of no relationship between the number of jobs held by the former students and their Farming Program Scores was not rejected.

Table 3

Frequency of Responses for the Number of Jobs
Held by the Former Students

Number of Jobs Held	Number of Responses	Percent of Responses
0	1	1.0
1	25	24.3
2	29	28.2
3	25	24.3
4	6	5.8
5	8	7.8
6	5	4.9
7	2	1.9
8	0	0
9	2	1.9
Total	103	100.1

Thirty-two percent of the respondents reported their yearly income as being between 10,001 and 15,000 dollars. Thirty percent had a yearly income between 15,001 and 20,000 dollars. Only 10.7 percent of the former students earned over 25,000 dollars a year. Since only a small number of the respondents had a yearly income greater than 25,000 dollars, they were placed in an income level category of 20,001 dollars and above. The Farming Program Scores were divided at the median to generate the cell sizes needed for a chi square analysis. The 50 percent of the scores which fell below the median were labeled "low" and those scores above the median were labeled "high." A chi square was computed on the yearly income of the former students and their Farming Program Scores. Results were statistically significant at the .05 probability level (Table 4). Therefore, the null hypothesis (the yearly income of the former students is independent of their Farming Program Scores) was rejected.

The Gamma coefficient between yearly income and Farming Program Score was .4340. Such a coefficient indicated that as the Farming Program Score of the former students increased so did their yearly income.

Table 4

Chi Square for the Yearly Income of the
Former Students by Their Farming
Program Scores

Farming Program Score	Number Earning $10,000 or Less	Number Earning $10,001 to $15,000	Number Earning $15,001 to $20,000	Number Earning $20,000 and Above
High	10	14	11	15
Low	21	19	7	6
Total	31	33	18	21

$X^2 = 9.327$, df = 3
significant at the .05 probability level

The mean years of education beyond high school was 1.213 for the respondents. The majority of the former students (55 percent) had not continued their education beyond high school. Thirty-one percent of the respondents had completed one to three years of education beyond high school, while 25.6 percent had completed four to five years of formal training beyond high school. A summary of the frequency of responses is presented in Table 5. The correlation coefficient between the years of education and the Farming PRogram Scores of the former students was r = .044. Since this was not significant at the .05 level, the null hypothesis (there is no relationship between the years of education of the former students and their Farming Program Scores) was not rejected.

Table 5

Frequency of Responses for the Number of Years
of Education Completed Beyond High School by
the Former Students

Years of Education	Number of Responses	Percent of Responses
0	55	53.4
1	14	13.6
2	11	10.7
3	7	6.8
4	12	11.7
5	4	3.9
Total	103	100.1

The perception statements were summed for each respondent to produce perception scores. The scores ranged from 97 to 138 with a mean of 114.24. The highest possible perception score was 140 and the lowest possible perception score was 28. The correlation coefficient between the perceptions held by the former students of the supervised occupational experience program and their Farming Program Score was r = .08. Since this coefficient was not statisitcally significant at the .05 level, the null hypothesis of no relationship between the perceptions of the supervised occupational experience programs of the former students and their Farming Program Scores was not rejected.

Conclusions

1. Students who participated in the supervised occupational experience program were likely to be employed full time.

2. The former students who had high Farming Program Scores were more likely employed in agriculture or agriculturally related jobs.

3. As the scope of the farming programs of the former students increased, so did the likelihood of their first job being in agriculture.

4. Those former students who had high Farming Program Scores tended to change jobs just as many times as those who had low Farming Program Scores.

5. The yearly income of the former students who had high Farming Program Scores was more likely to be higher than the yearly income of those who had low Farming Program Scores.

6. Those former students who had low Farming Program Scores were just as likely to have extended their education beyond high school as those who had high Farming Program Scores.

7. Perception of the supervised occupational experience program appeared to be about the same regardless of Farming Program Scores. Former students who had high Farming Program Scores appeared to hold the same perceptions of the supervised occupational experience program as those who had low Farming Program Scores.

8. The vocational agriculture program appears to influence student choice of occupations.

9. Most importantly, relationships were found between the supervised occupational experience program and establishment in an occupation when measured in terms of the nature of the present job, the nature of the first job, and yearly income. Therefore, the supervised occupational experience programs of the former students were related to their establishment in an occupation.

Recommendations

Because the supervised occupational experience program is related to establishment in an occupation:

1. The supervised occupational experience program should be continued in vocational agriculture.
2. Vocational agriculture students should be required to participate in the supervised occupational experience program.
3. Vocational agriculture students should be encouraged to have supervised occupational experience programs large in scope.
4. Vocational agriculture teachers should aid students in expanding the scopes of their supervised occupational experience programs.
5. The results of this study should be made available to vocational agriculture teachers, teacher educators and school administrators.

Recommendations for Further Study

1. This study should be made longitudinal to determine whether relationships continue to exist over time between the high school supervised occupational experience programs of the former students and progression in occupations.
2. More studies like the one by McMillion and Auville should be conducted to gather baseline data about the supervised occupational experience programs of students, including those in cooperative education programs.
3. Follow-up studies of this type should be conducted in all of the vocational agriculture options with the use of previous data bases to determine whether relationships exist between the supervised occupational experience program and establishment in an occupation.

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FACTORS ASSOCIATED WITH SUPERVISED OCCUPATIONAL EXPERIENCE IN CALIFORNIA VOCATIONAL AGRICULTURE PROGRAMS

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INTRODUCTION

The primary goal of vocational education in agriculture has traditionally been to prepare youth and adults for entry level employment in the agricultural industry. To achieve this goal, agricultural educators have used a teaching strategy consisting of three major components: Classroom instruction, supervised occupational experience (SOE), and Future Farmers of America (FFA) activities. The importance of SOE is summarized by Peterson and McCreight (1973), "one of the first requirements of an agricultural educator, is to have a real dedication and commitment to a supervised occupational experience program for every student. The 'heart and backbone' of a vocational agriculture curriculum is the supervised occupational experience program." Other researchers who have written about the importance of SOE include Williams (1978), Vaughn (1980), Long (1982).

Although SOE has been recognized as important in the educational process, Binkley (1977) stated, "Has the profession really accepted that part of the basic pattern of instruction in vocational agriculture today?..." Research by Iverson and Brown (1979), in the southern part of the United States, found that nearly two-thirds of the vocational agriculture program graduates did not have SOE programs. In addition, studies by Vaughn (1982), in New Mexico and Long (1982), in Utah revealed that less than 100 percent of the students enrolled in vocational agriculture had SOE programs.

If SOE is an essential component of vocational agriculture programs, but not all students enrolled have SOE's, the questions which is naturally raised is, why? Some of the factors which Tulloch (1979) identified included: Limited funding for supervision, too large a student-teacher ratio, enrollment of students with weaker agricultural backgrounds, and competing school activities. McCracken (1975), stated, "The success or failure of an occupational experience program for a student depends, to a large degree, upon the effectiveness of the supervision by the teacher." William (1978), noted that some students were not receiving adequate assistance with their SOE programs. Seefeldt as quoted by Harris (1980), charged that more realistic and

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meaningful ways need to be developed to provide all students with occupational experience programs. Binkley (1977), in the Agricultural Education Magazine warns: "The profession must develop a strong offense for the experience programs of our students. We had them at one time; we need them now. If we don't use the experience programs, we will lose them and end up teaching general agriculture."

Although agricultural educators have, in the main, been committed to involving all students in SOE, many educators in California and throughout the United States have begun to question the quality, quantity and integral nature of the experiential component of vocational agriculture programs. In response to this need, teacher educators in the Western Region developed a regional study to determine the status of supervised occupational experience programs.

PURPOSE

This study was designed to determine the perceptions of teachers and students relative to the participation of students in SOEP's in California. Also, the study focused on the identification of factors associated with students participating in SOEP's.

The specific objectives of the study were:

1. Determine the teachers perception of the percentage of students in California vocational agriculture programs who are involved in supervised occupational experience programs.
2. Determine the percentage of students who perceived they were involved in SOEP's.
3. Determine the factors associated with those students who perceived that they were involved in SOEP's.
4. Identify vocational agriculture programs where 75 percent or more of the students have SOEP's, as reported by the teacher.
5. Determine the factors associated with teachers/programs with 75 percent or more student participation in SOEP.
6. Determine those teacher related factors associated with participation in SOEP while controlling for student related factors.

METHODOLOGY

The population for this study consisted of all California schools having vocational agriculture programs as listed in the 1981-82 California Vocational Agriculture Directory. To ensure that schools from all areas of the state would be represented in the sample, stratified random sampling procedures were used. The seven supervisory regions of California served as the units for stratification. The sample for the survey, as determined by the Western Region Research Committee, consisted of 20 percent of the population of schools. The number of schools selected in each region was based on the proportion of schools and students in the region. Schools selected had a minimum of 40 agricultural students, and at least 10 students who had completed one or more years of vocational agriculture. The total sample comprised 20 percent of the population of schools producing a sample of 80 schools. In each school, 20 percent of the students having completed one or more years of vocational agriculture (or a minimum of 10) were selected at random to complete the survey. This resulted in the surveying of 1,047 students. Teacher information was based on surveys administered to the head teacher in each department or 80 teachers.

Data were collected using a student and teacher questionnaire. These instruments were developed by the Western Regional SOE Research Committee. However, an advisory committee of state staff was convened for the purpose of reviewing and validating the questionnaires. Under the direction of Paul Vaughn at New Mexico State University, a coefficient of reliability was determined for each item on both instruments using a test-retest procedure. Both instruments were deemed reliable with coefficients ranging from .63 to 1.0. While the California questionnaires differed slightly from the one used in New Mexico, both were field tested at schools not included in the sample. Results of the test indicated comparable reliabililty.

The questionnaires were administered in person by either project staff or regional supervisors at each of the 80 selected schools. All schools were visited during the period March 5 to April 12, 1982. The presence of project personnel insured proper student sampling and aided in correct completion of the survey instruments. All of the surveyors were given written instructions for administering the questionnaires which included the method of selecting students, questions to explain, and other procedures to be followed while at the school. Each surveyor also received on-site training by project staff at a school in their area.

Teacher and student questionnaires were coded and keypunched in preparation for analysis. Frequency, cross-tabulation, discriminant analysis, and multiple regression sub-programs of the Statistical Package for the Social Sciences were used to analyze the data.

RESULTS

Teacher Perceptions

Table 1 presents student and teacher perceptions of participation in supervised occupational experience programs. On the average, teachers reported that 57.1 percent of the students enrolled in their programs had a SOEP. From the student sample, it was found that 68.2 percent perceived they had a SOEP. Identified in Table 1, are the number of programs with greater or less than 75 percent SOEP, based on teacher data.

TABLE 1

STUDENT AND TEACHER PERCEPTION OF SOEP

	Teacher Perception	Student Perception
Percentage of students with SOEP	57.1	68.2
No. of programs with 75% SOEP	27.0	--
No. of Programs with < 75% SOEP	53.0	--
Total (N)	80	1,047

Student Factors

To determine student factors associated with student participation in SOEP, a discriminant analysis was performed on the student data. The number of students indicating they had a SOEP were contrasted with the number who said they did not. Both a direct and stepwise discriminant analysis was used to analyze the data. Table 2 summarizes the results of the direct discriminant analysis in which student variables were entered in a single step. The table lists these variables and the correlation with the single discriminant function which emerged. The canonical correlation coefficient was .74. This discriminant function was later used in the multiple regression analysis of the teacher data to act as a covariate, correcting for student influence on a program's level of SOEP participation.

Results of the stepwise discriminant analysis showed nine of the variables made significant additions to Rao's V. The nine variables produced good separation as indicated by the canonical correlation coefficient of .51 (Wilk's lamda of .74). The four most significant variables in this set are identical to those in the direct analysis: (1) level of FFA participation, (2) application for FFA awards or degrees (3) FFA membership and (4) perception of a record book required.

TABLE 2

DISCRIMINANT ANALYSIS OF SELECTED STUDENT VARIABLES[1]

Variable	Correlation between variable & the discriminant function
Level of FFA Participation	.74
Application for FFA Awards or Degrees	.72
Membership in FFA	.61
Record Book Requirement	.48
Ethnicity	.26
Average Grades in School	.20
Is SOEP Required	.18
Family Source of Income	.16
Place of Residence	.14

[1] N = 1,047

Teacher and Program Factors

Identification and analysis of teacher and program factors was first done by separating the teachers into two groups for analysis; those who reported more than 75 percent of their students with a SOEP, and those with less than 75 percent participation. Tests of association and significance were made between this variable and selected independent variables from the teacher survey. Statistical treatment was Kendall's tau for ordinal data, and Cramer's V in association with a Chi square for determining strength of association and significance for nominal data. Of the 16 variables tested, only three were significant at the .05 level. These were: SOEP required, portion of grade from SOEP, and class projects provided for SOEP (see Table 3).

TABLE 3

RELATIONSHIP BETWEEN SELECTED TEACHER VARIABLES
AND 75 PERCENT OR MORE OF STUDENTS WITH SOEP's[1]

Variable	Coefficient of Correlation
Course Pattern	.06
No. of Full Time Teachers'[2]	-.17
Vehicle for SOEP Visits	.17
Release Time for Visits	.19
Reimbursement for Expenses	.18
Extended Contract	.13
Extra Duty Pay	.10
Length of Contract[2]	.13
Visits per Year	.17
SOEP Required	.49*
Portion of Grade from SOEP	.34*
Ag. Dept. Policy on SOEP[2]	.09
Ag Dept. Guidelines for SOEP	.14
Class Project Provided	.23*
Facilities for SOEP	.05
Years Teaching Vo Ag[2]	.25

[1] N = 27
[2] Indicates Ordinal data
* Indicates significant at .05 level

To further analyze teacher factors and composite variables, a multiple regression analysis was performed using the full range of values for percentage of students conducting SOEP as the dependent variable. Two of the original independent variables, course pattern and years of teaching experience, were used in the analysis. Three composite variables were also formed for the regression model: Direct support to teachers, direct support to students, and indirect support to teachers and students. Direct support to teachers was determined by summing for each case positive responses to: Vehicle for SOEP visits, release time, extra duty pay, extended contract, and length of contract greater than 10 months. This variable was constructed to reflect direct (monetary) support from the district for SOEP. Direct support to students was computed by summing responses to questions pertaining to facilities and services provided to students for SOEP. This included: Land laboratory, greenhouse, agriculture shop, animal facility, other facilities, FFA student loan, animal breeding chain, tools provided, equipment co-op, feed purchase and distribution, and service club, bank, or community organization assistance. The third composite variable, indirect support to teachers and students was constructed to reflect policy and attitudinal factors. Positive responses to the following were summed for each case: SOEP required, more than 10 percent of grade from SOEP, agriculture department policy on SOEP requirements, agricultural department guidelines for an acceptable SOEP, more than two visits per student per year, and indication of SOEP being of great value to the program.

The discriminant function which was derived from the student data served as a control variable (or covariate) in the regression analysis. The student discriminant function made a significant contribution as indicated by a correlation coefficient of -.34, and was significant at the .01 level as indicated by F(1,78) = 9.6 and F(6,71) = 6.57. The regression analysis was run once with and once without this variable included. Both analysis indicated a strong positive relationship between percent of students with a SOEP and the variables direct teacher support and indirect support. Without the control variable, both were significant at the .01 level with F(1,78) = 7.194 for direct teacher support and F(1,78) = 9.206 for indirect support and zero-order correlation coefficients of .30 and .36 respectively. With the control variable, both factors were significant at the .05 level with F(6,71) = 4.395 for direct teacher support with a partial correlation coefficient of .30, and F(6,71) = 6.498 for indirect support, with a partial correlation coefficient of .38 (see Table 4). None of the other variables showed significant association. Very little correlation between independent variables was observed in the correlation matrix.

TABLE 4

RESULTS OF MULTIPLE REGRESSION, PERCENTAGE OF SOEP WITH SELECTED TEACHER VARIABLES[1]

Variable	R	R^2	Correlation Coefficient
Student Covariate	.34	.11	-.34*
Direct Support to Teachers[2]	.42	.18	.30*
Indirect Support[2]	.52	.27	.38*
Direct Support to Students[2]	.32	.27	.14
Years Teaching Experience	.53	.29	-.07
Course Pattern	.53	.29	-.09

[1] N = 80
[2] Composite variables
*Significant at the .05 level

CONCLUSIONS

Based on the results of this research the following conclusions are made:

1. On the average, teachers reported that 57 percent of their students had a SOEP, and 68 percent of the students, in the sample, reported participation in a SOEP. These findings confirmed that not all students enrolled in vocational agriculture programs in California have a SOEP. Also, it raised the question as to the integral nature of SOEP in California vocational agriculture programs.
2. The student factors of level of FFA participation, application for FFA awards or degrees, membership in the FFA, and required record book were significantly associated with student participation in supervised occupational experience programs.
3. The major teacher factors found to be significantly associated with programs that had 75 percent or more students with SOEP's included: SOEP required by program, portion of grade from SOEP, and provision of a class project.
4. Composite teacher variables were developed by grouping specific factors in one of three categories. The teacher variables of indirect teacher support and direct teacher support were found to be significantly related to student participation in SOE. It was interesting to find that when some of the factors used to form the composite variables were analyzed individually, they were not found to be significantly associated with the dependent variable. Apparently provision of several forms of related support for SOEP can have greater impact on student participation than that of any one form of support.

RECOMMENDATIONS

Based on the results and conclusions of this study the following recommendations are made:

1. Researchers in the western states conducting similar research should be encouraged to analyze their data using composite variables that reflect major conceptual areas of supervised occupational experience rather than using variables that are too specific and by themselves appear to be of limited value.
2. Based on the significant association of the teacher variables, indirect and direct support, i.e. school policy on SOEP, vehicle, length of contract, with student participation in SOEP, it is recommended that state leaders in agricultural education work with local teachers and administrators to develop policies that will encourage 100 percent SOEP participation by students enrolled in California vocational agriculture programs.
3. This research indicated a significant association between membership in the Future Farmers of America (FFA) and student participation in SOEP. This raises some interesting questions for further study regarding the nature of the relationship between FFA and SOEP. Does membership in the FFA lead to participation in SOEP? Or, does some other unidentified variable lead to greater participation in general. These and other similar causal relationships need to be studied.

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FACTORS ASSOCIATED WITH SUPERVISED OCCUPATIONAL EXPERIENCE IN CALIFORNIA VOCATIONAL AGRICULTURE PROGRAMS

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INTRODUCTION

The primary goal of vocational education in agriculture has traditionally been to prepare youth and adults for entry level employment in the agricultural industry. To achieve this goal, agricultural educators have used a teaching strategy consisting of three major components: Classroom instruction, supervised occupational experience (SOE), and Future Farmers of America (FFA) activities. The importance of SOE is summarized by Peterson and McCreight (1973), "one of the first requirements of an agricultural educator, is to have a real dedication and commitment to a supervised occupational experience program for every student. The 'heart and backbone' of a vocational agriculture curriculum is the supervised occupational experience program." Other researchers who have written about the importance of SOE include Williams (1978), Vaughn (1980), Long (1982).

Although SOE has been recognized as important in the educational process, Binkley (1977) stated, "Has the profession really accepted that part of the basic pattern of instruction in vocational agriculture today?..." Research by Iverson and Brown (1979), in the southern part of the United States, found that nearly two-thirds of the vocational agriculture program graduates did not have SOE programs. In addition, studies by Vaughn (1982), in New Mexico and Long (1982), in Utah revealed that less than 100 percent of the students enrolled in vocational agriculture had SOE programs.

If SOE is an essential component of vocational agriculture programs, but not all students enrolled have SOE's, the questions which is naturally raised is, why? Some of the factors which Tulloch (1979) identified included: Limited funding for supervision, too large a student-teacher ratio, enrollment of students with weaker agricultural backgrounds, and competing school activities. McCracken (1975), stated, "The success or failure of an occupational experience program for a student depends, to a large degree, upon the effectiveness of the supervision by the teacher." William (1978), noted that some students were not receiving adequate assistance with their SOE programs. Seefeldt as quoted by Harris (1980), charged that more realistic and

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meaningful ways need to be developed to provide all students with occupational experience programs. Binkley (1977), in the Agricultural Education Magazine warns: "The profession must develop a strong offense for the experience programs of our students. We had them at one time; we need them now. If we don't use the experience programs, we will lose them and end up teaching general agriculture."

Although agricultural educators have, in the main, been committed to involving all students in SOE, many educators in California and throughout the United States have begun to question the quality, quantity and integral nature of the experiential component of vocational agriculture programs. In response to this need, teacher educators in the Western Region developed a regional study to determine the status of supervised occupational experience programs.

PURPOSE

This study was designed to determine the perceptions of teachers and students relative to the participation of students in SOEP's in California. Also, the study focused on the identification of factors associated with students participating in SOEP's.

The specific objectives of the study were:

1. Determine the teachers perception of the percentage of students in California vocational agriculture programs who are involved in supervised occupational experience programs.
2. Determine the percentage of students who perceived they were involved in SOEP's.
3. Determine the factors associated with those students who perceived that they were involved in SOEP's.
4. Identify vocational agriculture programs where 75 percent or more of the students have SOEP's, as reported by the teacher.
5. Determine the factors associated with teachers/programs with 75 percent or more student participation in SOEP.
6. Determine those teacher related factors associated with participation in SOEP while controlling for student related factors.

METHODOLOGY

The population for this study consisted of all California schools having vocational agriculture programs as listed in the 1981-82 California Vocational Agriculture Directory. To ensure that schools from all areas of the state would be represented in the sample, stratified random sampling procedures were used. The seven supervisory regions of California served as the units for stratification. The sample for the survey, as determined by the Western Region Research Committee, consisted of 20 percent of the population of schools. The number of schools selected in each region was based on the proportion of schools and students in the region. Schools selected had a minimum of 40 agricultural students, and at least 10 students who had completed one or more years of vocational agriculture. The total sample comprised 20 percent of the population of schools producing a sample of 80 schools. In each school, 20 percent of the students having completed one or more years of vocational agriculture (or a minimum of 10) were selected at random to complete the survey. This resulted in the surveying of 1,047 students. Teacher information was based on surveys administered to the head teacher in each department or 80 teachers.

Data were collected using a student and teacher questionnaire. These instruments were developed by the Western Regional SOE Research Committee. However, an advisory committee of state staff was convened for the purpose of reviewing and validating the questionnaires. Under the direction of Paul Vaughn at New Mexico State University, a coefficient of reliability was determined for each item on both instruments using a test-retest procedure. Both instruments were deemed reliable with coefficients ranging from .63 to 1.0. While the California questionnaires differed slightly from the one used in New Mexico, both were field tested at schools not included in the sample. Results of the test indicated comparable reliabililty.

The questionnaires were administered in person by either project staff or regional supervisors at each of the 80 selected schools. All schools were visited during the period March 5 to April 12, 1982. The presence of project personnel insured proper student sampling and aided in correct completion of the survey instruments. All of the surveyors were given written instructions for administering the questionnaires which included the method of selecting students, questions to explain, and other procedures to be followed while at the school. Each surveyor also received on-site training by project staff at a school in their area.

Teacher and student questionnaires were coded and keypunched in preparation for analysis. Frequency, cross-tabulation, discriminant analysis, and multiple regression sub-programs of the Statistical Package for the Social Sciences were used to analyze the data.

RESULTS

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Table 1 presents student and teacher perceptions of participation in supervised occupational experience programs. On the average, teachers reported that 57.1 percent of the students enrolled in their programs had a SOEP. From the student sample, it was found that 68.2 percent perceived they had a SOEP. Identified in Table 1, are the number of programs with greater or less than 75 percent SOEP, based on teacher data.

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CONCLUSIONS

Based on the results of this research the following conclusions are made:

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VOCATIONAL AGRICULTURE TEACHER CHARACTERISTICS AND THEIR RELATIONSHIP TO PERCEPTIONS OF SOE IMPORTANCE, ATTITUDES TOWARD SUPERVISION, AND QUALITY OF SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

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INTRODUCTION

The supervised occupational experience program (SOEP) has been recognized by agricultural education as an inseparable component of the vocational agriculture program since the inception of the Smith-Hughes Act in 1917. Vocational agriculture has undergone many changes through the years but its advocates have always maintained that the concept of learning by doing is central to the program.

Recent studies in agricultural education continue to document benefits of the SOEP. Rawls (1978) found that parents felt students derived three major benefits from SOE: i.e., work attitude, occupational development and human relations skills. Morton (1978) found a positive relationship between achievement test scores and quality scores of occupational experience programs.

It is apparent that there is general agreement that a strong SOEP is needed. A key point in having strong occupational experience programs is that there must be strong supervision.

A review of the literature revealed that supervision is essential for the success of experience programs in vocational agriculture (Deyoe, 1943; Binkley and Tulloch, 1981; Hammonds, 1950; Williams 1977; Phipps, 1980). Binkley (1955) pointed out that the most successful SOE programs were associated with teachers who were actively involved in supervisory activities. Furthermore, Knebel (1955) found that teachers in above average departments made more supervisory visits than those in below average departments. Hence, one would conclude that supervision is very important and has a good payoff.

Yet in the early eighties, there was widespread concern that the quality of SOEP's was declining, the commitment to them was lessening and the attitude of teachers toward SOEP and its supervision was declining.

Binkley toured vocational agriculture departments in 12 states in 1975 and expressed concern that SOE programs may have decreased to a low level of quality (Binkley, 1977). Miller (1980) reported that vocational agriculture teachers in North Carolina expected only 58% of their students to have an SOE program. Miller also found that less time in 1977 was devoted to SOE supervision than in 1972 and that 42% of the teachers reported they did not make visits to students on a regular basis. Iverson (1980) studied graduates in 10 southern states and discovered that 40% did not have an SOE project during each year they were enrolled in vocational agriculture.

The authors could find no data regarding the vitality of the SOE programs in Areas I and II of Texas, home of author David Harris. Hence, the authors sought to determine the status of perceptions of vocational agriculture teachers in Areas I and II of Texas regarding how important they felt SOE programs were and their attitudes toward supervision of such programs. These two areas of Texas were selected solely because of the interest of the authors in knowing the status of SOE programs among these teachers.

The specific objectives of this investigation were to:

1. Describe selected demographic characteristics of vocational agriculture teachers who participated in this study.

2. Determine the teachers' perceived importance of the SOE program.

3. Determine the teachers' attitudes toward supervision of SOE programs.

4. Determine the relationship between selected teacher characteristics and teachers' views of importance of SOE and attitude toward supervision of SOE programs.

5. Determine the relationship between quality of SOE programs conducted by teachers and their view of importance of SOE, and attitudes toward SOE program supervision.

METHODS AND PROCEDURE

Population and Sample

The target population for the study consisted of all production vocational agriculture teachers in Areas I and II of Texas (N = 249). From this population, a random sample of 100 teachers was drawn.

Design

This was a descriptive correlational study. Data were collected to describe teachers' perceived level of importance toward SOE and attitudes toward supervising SOE programs. It seemed logical that certain factors might account for some of the variance in attitudes about SOE and how important teachers felt it was. Thus, relationships were investigated concerning teachers' ratings of importance of SOE and their attitudes toward supervision and selected teacher characteristics. Likewise, relationships between importance scores and attitudes and quality of SOE programs were examined.

Instrumentation

The researchers developed the instruments to measure teacher characteristics, quality of SOE programs, teachers' perceived level of importance toward SOE programs and teachers' attitudes toward supervising the SOE program using approved practices as recommended by Donald (1960), Dillman (1978) and Edwards (1957). The instrument used to measure attitudes toward SOE drew on the earlier work of Byers (1972).

Faculty in agricultural education at The Ohio State University established the content validity of the instruments. The instruments were pilot tested with a randomly selected group of 30 vocational agriculture teachers from Areas I and II of Texas. These were teachers who were not used in the final study. The pilot test showed the reliability (Cronbach's Alpha) was r = .75 for the importance of SOE section and r = .91 for the attitudes toward supervision section. Once revisions, based on the pilot test, were made, the instrument was used for data collection.

Data Collection

The questionnaire was mailed to the teachers on November 4, 1982, and postcard reminders were mailed on November 18, 1982. On December 2, 1982, a second instrument package was mailed to teachers who had not responded. This procedure produced a 90% return. Non-respondents (n = 10) were followed up by telephone. There were no differences between respondents and non-respondents.

FINDINGS

Characteristics of the Respondents

Forty-six percent of the teachers taught in single-teacher departments and 43% taught in two-teacher departments. The average number of years of teaching vocational agriculture was 11.6. Fifty-eight percent of the teachers held B.S. degrees, and 42% held master's degrees. The average age was 36 years.

Perceived Importance of SOE Program

The instrument measuring perceived importance of SOE programs consisted of 22 statements which were scored on a four-point Likert-type scale. The highest possible score was 88; the lowest 22. The mean item score was 3.3 and the overall mean was 74.5.

Attitudes Toward Supervision of SOE Programs

Forty-one statements were scored on a four-point Likert-type scale. Thus, the highest overall score was 164; the lowest was 41. The overall item mean was 3.2 and the overall meanwas 134.

Relationship Between Characteristics of Teachers and Importance and Attitude Scores

Characteristics of teachers were divided into three categories: professional activity characteristics, personological characteristics and departmental characteristics. As can be seen in Table 1, the relationships between both importance and attitude scores and professional characteristics were generally negligible. The only characteristics with any sizeable magnitude or correlation (and it was low and positive) was attendance at state teachers' conferences. Note, however, that all but three of the respondents attended conferences.

Likewise, as can be seen in Table 2, personological characteristics of teachers were negligibly related to importance and attitude scores.

There was a significant low positive correlation between having vocational agriculture prior to teaching and teachers' attitudes toward supervision of occupational experience programs.

Departmental characteristics were also negligibly related to importance and attitude scores by in large. See Table 3. There was low positive association between number of teachers and students in the department and percentage of students in FFA and importance scores. There was a low positive relationship between reimbursement for travel and attitude toward supervision.

Quality of SOE Programs

Using a formula developed by David Harris, a quality score for each department's SOE programs was calculated. Table 4 shows that quality scores ranged from 14 to 42. The mean quality of SOEP score was 29.3 with a standard deviation of 4.6. Sixty-three percent of the scores were between 27 and 32.

The data which were used to derive the quality of SOEP scores revealed some interesting findings. Fifty-eight percent of the departments had 100% of the students with SOE programs in 1981-82; 2.2% of the schools had fewer than 70% of their students with SOE programs. The average number of visits per grading period was 2.6, and 75% of the teachers reported visiting every student at least once in the preceding 12 months. The median number of visits for students per year was 7.7.

Relationship Between Teacher Characteristics and Quality of SOE Programs

A low to moderate relationship exists between both importance scores and attitudes toward supervision of occupational experience programs. See Table 5.

CONCLUSIONS

1. Teachers in Areas I and II of Texas believe SOE is an integral part of vocational agriculture and that production agriculture students should have supervised occupational experience.

2. Teachers in Areas I and II of Texas support the concept of supervising occupational experience programs. Furthermore, the extent to which they are supervising occupational experience programs is better than that reported in other recent studies.

3. Quality differs among SOE programs and can be determined by the formula used in this study. It is positively related to the teachers' view of importance of occupational experience and their attitude toward supervision of SOE programs.

4. Characteristics of teachers which were examined in this study do not begin to explain the variance in teachers' views of importance of SOE programs, attitudes toward supervision nor quality of programs.

RECOMMENDATIONS

1. This study needs to be replicated in other areas of the country to determine if teachers nationwide have as favorable an attitude toward the importance of SOE programs and the supervision of these programs as teachers in Areas I and II of Texas.

2. Further work needs to be done in the profession to develop an agreed upon measure of quality of SOE programs.

3. Further study is needed to determine why the findings of this study are contrary to results reported in other parts of the country. What are the factorsin Areas I and II of Texas that are contributing to the favorable results regarding SOEP practices?

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Table 1
Relationship of Professional Activity Characteristics to Importance of SOE Programs and Attitudes Toward Supervision

Professional Activity Characteristics (n = 87)	Importance		Attitudes	
	r	p	r	p
1. Membership in TVATA (no = 1; yes = 2)	.13	.115	.07	.246
2. Membership in VATA (no = 1; yes = 2)	.02	.429	.03	.389
3. Membership in AVA (no = 1; yes = 2)	.15	.080	.07	.263
4. Other Professional Organizations (no = 1; yes = 2)	.03	.401	.08	.233
5. Subscription to The Agricultural Education Magazine (no = 1; yes = 2)	.02	.438	.03	.388
6. Attendance at district meetings (none = 0; one = 1; two = 2; three = 3)	.10	.248	.01	.364
7. Attendance at state teacher conference (no = 1; yes = 2)	.25*	.009	.20*	.030
8. Attendance at state FFA convention (no = 1; yes = 2)	.03	.398	.01	452
9. Participation in leadership (no = 1; yes = 2)	.01	.461	.12	.139
10. Participation in judging (no = 1; yes = 2)	.09	.191	.04	.358
11. Adult Education Programs (none = 1; other adult program = 2; young farmer chapter = 3)	.07	.274	.02	.403

* = $p < .05$

Table 2
Relationship of Personological Characteristics
to Importance of SOE Programs and Attitudes Toward Supervision

Personological Characteristics (n = 87)	Importance r	Importance p	Attitudes r	Attitudes p
1. Level of formal education (B.S. = 1; M.S. = 2)	.09	.195	-.03	.383
2. Age	.06[a]	.286	-.03[a]	.407
3. Teaching Experience	.11[a]	.162	.05[a]	.331
4. Length of Contract (11 month = 1; 12 month = 2)	.05	.330	.08	.219
5. Vocational Agriculture Experience Prior to Teaching (no = 1; yes = 2)	.12	.121	.27*	.006
6. Employment Other Than Teaching (no = 1; yes = 2)	.02	.415	.05	.314

[a] = Pearson Product-Moment Correlation Coefficients; all other correlation coefficients are point biserial.

* = $p < .05$

Table 3
Relationship of Departmental Characteristics to
Importance of SOE Programs and Attitudes Toward Supervision

Departmental Characteristics (n = 87)	Importance		Attitudes	
	r	p	r	p
1. Number of teachers in department	.19*[a]	.035	.07[a]	.252
2. Number of students in department	.18*[a]	.045	.14[a]	.105
3. Percentage of students in FFA (90% = 1; 90-94% = 2; 95-99% = 3; 100% = 4)	.20*	.028	.13	.107
4. Class periods available for supervision (none = 0; one = 1; two = 2; three = 3; four = 4)	.15	.083	.10	.174
5. Administrative Support (no = 1; yes = 2)	.01	.467	-.01	.450
6. Reimbursement for Travel (< adequate = 1; adequate = 2; > adequate = 3)	.03	.368	.21*	.024
7. Utilization of SOE Point Guide System (11 categories - Less than 10% = 1; 100% = 11)	.08	.206	.04	.368

[a] = Pearson Product-Moment Correlation Coefficients; all other correlations are point biserial coefficients.

* = $p < .05$

Table 4
Quality Scores of SOE Programs

Score	f	%
14	1	1.1
18	1	1.1
20	2	2.3
21	1	1.1
22	2	2.3
24	2	2.3
25	4	4.6
26	4	4.6
27	10	11.5
28	12	13.9
29	4	4.6
30	9	10.5
31	11	12.8
32	8	9.2
33	3	3.4
34	3	3.4
35	5	5.7
37	1	1.1
38	1	1.1
39	2	2.3
42	1	1.1
Total	87	100.0

$\bar{x}$ = 29.3; SD = 4.6; Median = 29.5; Mode = 28

Table 5
Relationship Between Views of SOE Importance, Attitudes Toward Supervision, and Quality of SOE Programs

Variable	Importance	Attitude
Quality of SOE Programs	.32*	.23**

* = p < .001; ** = p < .05

CRITIQUE

Attitudes of Local Achool Administrators Toward Vocational Agriculture Programs
by
Michael F. Burnett and Gibson R. Miller

Status and Importance/Support for SOEP as Perceived by New York Vocational Agriculture Teachers and Their Building Administrators
by
Arthur L. Berkey and H. Dean Sutphin

Relationship of Vocational Agriculture Student Satisfaction to Selected Student, School and Program Variables
by
Larry R. Arrington and William H. Price

Concurrent Session E, 10:15 - 11:45 a.m., December 2, 1983
Tenth Annual National Agricultural Education Research Meeting
American Vocational Association Convention
Anaheim, California

Discussant
Larry E. Miller
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Attitudes of Local School Administrators Toward Vocational Agriculture Programs

by

Michael F. Burnett and Gibson R. Miller

This study presents many excellent points related to the research methodologies; succint, clear writing style; and as a meaningful contribution to knowledge in the field. The purpose and objectives are clearly stated and follow a rational Introduction. Procedures are clearly presented.

Looking at the study in terms of the threats to validity of survey research, one finds:

> Sampling error: A census was taken of all superintendents and supervisors. The determination of sample size for principals was documented, but the margin or error and risk were not reported. The rationale for stratifying the principals was not given. Evidently, the strata were not of great interest as they were not treated as blocking variables for analysis in the reported results. Using two populations and one sample limits the potential analysis with inferential statistics.
>
> Selection error and Frame error: The authors do not report how the frames of the target populations were obtained, and therefore the reader has to assume that the lists were accurate and without omissions, duplications and errors.
>
> Non-response error: The authors appear to use very satisfactory follow-up procedures to obtain as high a response rate as possible. A comparison of early with late respondents was made to control this error. Additionally, some non-responding superintendents and principals were surveyed by telephone. However, the rationale for not surveying non-responding supervisors is unclear. Even with a high response rate non-respondents could be different than respondents.
>
> Measurement error: Content validity of the instrument was established. The kind of revisions made after review is unclear. Could it be that revalidation could be necessary? The reliability of the instrument for stability or internal consistency is not reported. The Likert-type scale is a summated rating scale; so, opinions on items could be summed. If the instrument was internally consistent, then items within groups could be summed and tests of significance among groups made without experiment-wise error rate being a problem.
>
> The reader should also note that all opinion items were positive which invites response sets. Some negatively worded items, particularly early on the questionnaire might have been beneficial.

The use of a practical significance scale was interesting and should be observed by the readers.

The conclusions were consistent with the results. I do wish the writers had made some recommendations and implications from the study. The conclusions say, obviously, that the administrators had similar opinions. This fact could hold several implications for practice in Louisiana.

Status and Importance/Support For Supervised Occupational Experience Programs (SOEP) as Perceived by New York Vocational Agriculture Teachers and Their Administrators

by

Arthur L. Burkey and H. Dean Sutphin

This study was undertaken to provide data to help strengthen SOEP in New York given the materials produced from the Northeastern United States Development effort. There is little doubt that SOEP is an important component of our program and warrants further study.

Survey methodologies were employed to gather data for the study. A weakness of survey research is that it assesses characteristics at one point in time, and the authors (Recommendation 4) acknowledge this and propose a trend study in the future. Methodologically, the study is well done. Note how each of the following types of errors in survey research were controlled:

> Sampling error: No sampling was done; it was a census of two populations.
> Selection error and Frame error: The "Population and Sample" section describe the care they took to make sure their frame was accurate and complete.
> Non-response error: This error was discussed and appropriate limitations brought to our attention.
> Measurement error: The writers report that their instrument was reliable and valid.

Some points which might help the study (paper) if they were given further elaboration include:

1. Building a theoretical rationale for why building administrators were studied.
2. Building a theoretical rationale for the demographic characteristics and why they were studied.
3. Making Objective 1 clearer. (Demographic characteristics of whom? None reported for administrators.)
4. Type of research -- Could have been correlational, but was not. Data explores, describes and compares two populations but does not correlate (explain or predict).
5. Since the entire population was studied, parameters were generated (not statistics) and inferential statistics, such as Chi Square and the t-test, were not needed. Description was absolute without inference.

The results, conclusions and recommendations highlight some things about which the profession should be concerned.

Relationships of Vocational Agriculture Student Satisfaction to Selected Student, School, and Program Variables

by

Larry R. Arrington and William H. Price

This study is a good example of how important questions can be addressed in the profession with a relatively limited effort. The authors are to be commended for utilizing some "forward-steps" in the conduct of the study. The telephone interviewing is a valid methodology, not a commonly utilized one, but one that may become more common as postage costs escalate. The factor analysis was also a step further than most researchers would typically go. The contribution from the factor analysis was worth the effort.

The researchers also carefully reported their procedures for controlling potential threats to the validity of the study. Note:

Sampling error: The study was a census so no sampling was done for the sampling unit of schools, but a random sample was drawn from the students.
Selection error and Frame error: The authors carefully describe their procedures. Since only 93 percent of the schools (teachers) responded, some frame error exists, but note that the authors carefully confine their generalizations to "respondents" as they should. Selection error would only be a problem if one student were enrolled in two schools.
Non-response error: Eighteen percent of the 385 Ss were non-respondents and the authors followed appropriate procedures to control this error.
Measurement error: A panel of experts established content validity, and reliability was established at .87.

Some points which I believe might help the study (paper) if they were given further elaboration include:

1. In the Introduction, develop a rationale of why "Satisfaction" is an appropriate variable to study.
2. Conceptualize the construct "satisfaction" in more constitutive terms. What is it? What is a student's frame of reference for reporting their perceived satisfaction? That is, a response to an item such as "Taught me skills useful in production agriculture" might not be compared against what should be taught by the best of teachers.
3. The objective to measure "satisfaction" seems to migrate in the study to the measurement of attitude toward "program evaluation statements." My contention seems supported by the factor analysis which in essence indicates that not one construct (satisfaction) was being assessed but three constructs which were "Values of the Program," "Instructional Program," and "Career Guidance." None of the three factored constructs were labeled "Satisfaction." I suspect that the content validity for the original development may not have clearly defined the construct "satisfaction."

4. Why was the analysis for FFA contests only done on current FFA members? Were "Vo-Ag" contests not considered?
5. Likert scales are summated rating scales and internal consistency reliability is established so they can be summed. Authors did not sum across items. They did not need internal consistency or a Likert scale if they were going to consider and report each item as a domain. Stability of response, test-retest reliability, would have been more appropriate.
6. The third factor, Career Guidance, has the items of "years in FFA" and "years of participation in SOEP." Since both are temporally oriented, I would suspect that this construct has a multicollinearity problem and both items have much covariance, therefore, they would vary (load) together not on this construct but one like "years enrolled in vocational agriculture."

The authors do a good job of stating their conclusions and positing appropriate recommendations. As per Recommendation 4, a panel or cohort study of a longitudinal nature would be interesting and I hope they pursue such a study. We have not done enough longitudinal studies in agricultural education.

Their study prompts me to ask, "Do we really know who we are serving in vocational agriculture?" Ninety percent of the students lived on less than 50 acres, with 39 percent on one acre or less. Over 99 percent agreed they learned skills that would help them in production agriculture. How many will ever use these skills? Only 2.6 percent (n=8) intended to farm; yet, 30.3 percent (n=95) were enrolled in production agriculture programs. Are those programs meeting the needs of the other 87?

ATTITUDES OF LOCAL SCHOOL ADMINISTRATORS TOWARD VOCATIONAL AGRICULTURE PROGRAMS

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INTRODUCTION/NEED FOR THE STUDY

Vocational education in America has played an important role in the development of the United States. Early in its history, the leaders recognized the need for a skilled citizenry. In 1917 with the passage of the National Vocational Education Act, better known as the Smith-Hughes Act, Congress began to provide Federal funds for vocational training of less than college grade in the areas of agriculture, home economics, and trades and industry. Later, amendments to this act authorized funds for distributive education. The programs proved to be successful, thus encouraging Congress to provide additional funds periodically for the expansion of programs to meet the needs of larger segments of the population.

Ideally, training received in high school vocational education programs should provide the skills and competencies necessary for gainful employment upon completion of the program. However, studies by Hayles (1963), Bass (1969), Edington and Hill (1964), Lamers (1971), and Kotrlik (1980), seem to indicate that a large number of former students of vocational programs are entering occupations not related to the type of training received. Thus serious doubts have been raised by the citizenry, as well as by public officials, concerning the effectiveness of existing high school vocational education programs.

The curriculum followed in schools, although not totally dictated by local school administrators, is greatly affected by their influence. If modification is to occur, if growth of vocational programs is to continue, if existing programs are to be continued, or if new programs are to be instituted, then the support of the local school administrator becomes extremely important.

Considering the impact of local school administrators on high school vocational programs, it was felt that an assessment of the attitudes of these groups toward vocational programs (specifically vocational agriculture programs) would be of great importance in efforts to maintain and/or expand existing programs.

OBJECTIVES OF THE STUDY

The purpose of the study was to determine and compare the attitudes of public school superintendents, public secondary school supervisors for vocational education, and public secondary school principals in Louisiana toward vocational agriculture programs.

The following specific objectives were formulated as a means of achieving the purpose of the study:

(1) To determine the attitudes of local public school administrators (superintendents, vocational supervisors, and principals) toward the vocational agriculture program in Louisiana.

(2) To compare the attitudes of the three groups of local administrators (superintendents, vocational supervisors, and principals) toward the vocational agriculture program in Louisiana.

METHODS AND PROCEDURES

The descriptive method of research using a closed-form opinionnaire with a Likert-type scale was used to gather data for this study. Respondents were asked to indicate their opinion toward selected statements on a five point scale having numerical values as follows: 1 - Strongly Disagree; 2 - Disagree; 3 - Undecided; 4 - Agree; 5 - Strongly Agree.

Instrumentation

The opinionnaire utilized in the study was initially developed by Dr. Gibson Miller as part of his doctoral research and was based on a review of related literature. This preliminary instrument was then validated through a review by selected vocational agriculture teachers in Louisiana and vocational teacher educators in four states of the Southeastern United States.

Revisions were then made based on the input from these groups of reviewers and the final instrument was prepared and distributed by mail to the selected sample.

Data Sources

The target population for this study was local public school administrators (defined as superintendents, vocational supervisors, and principals) in Louisiana. The group selected for participation in the study included the following: all 66 public school superintendents in Louisiana; the supervisor for vocational education of each of the 66 public school systems in Louisiana; and 186 of the 353 identified public secondary school principals in Louisiana. One hundred and eighty-six principals were used in accordance with the formula for determining sample size as published by the research division of the National Education Association (Krejcie and Morgan, 1970).

The sample of secondary school principals was stratified based on the state athletic school size classifications. A proportional random sample was drawn from each of the school size strata (see Table 1).

TABLE 1

Response Rate By Occupation and School Size Classification

Group	Sample Size	Number of Respondents	Percent Response
Superintendents	66	57	86.4
Supervisors	66	63	95.5
Principals	186	175	94.1
4-A Schools	41	37	90.2
3-A Schools	27	26	96.3
2-A Schools	36	34	94.4
A-B Schools	50	48	96.0
C Schools	32	30	93.8
All Respondents	318	295	92.8

Data Collection

After the initial instrument was developed, it was validated through a review by selected vocational teachers and vocational teacher educators. Appropriate changes were made, and the final instrument was prepared and distributed to the selected sample.

One hundred and ninety-one opinionnaires were received as a result of the initial mail-out for a 60.1 percent response. Non-response follow-up utilized in this study included a post card reminder ten days after the initial mail out; a follow-up letter and second copy of the opinionnaire three weeks after the initial mail out; and a telephone contact to the non-respondents one month after the first mail out. The response rate at the end of this period was 91.2 percent.

Item means from the opinionnaire received prior to the phone follow-up were compared to item means from the opinionnaire received following the phone follow-up. No differences were found between them by visual observations. To further determine if differences existed between respondents and non-respondents, two non-responding superintendents were surveyed by phone. Three non-responding principals were likewise surveyed by phone. Again, no differences in responses could be detected. It was concluded that no differences in attitudes existed between the respondents and non-respondents in the research project. Because of the high response from supervisors, no subsequent phone follow-up was conducted. A final total of 295 opinionnaires were returned representing a 92.8 percent response rate. Table 1 shows the sample size and response rate for each of the sub-groups in the study.

RESULTS

Three groups of local school administrators (superintendents, vocational supervisors, and principals) were surveyed concerning their attitudes toward vocational agriculture programs. Twenty-four items were used to assess their attitudes. Respondents were asked to indicate their degree of agreement with each of the items using a five point Likert-type scale ranging from Strongly Disagree to Strongly Agree.

Findings

The attitude of each group of administrators was determined for each of the 24 items. Tables 2, 3, and 4 present the mean rating for each of the 24 items by the three groups of administrators (superintendents, supervisors, and principals respectively).

Superintendents' ratings are presented in Table 2. The items rated highest by this group were: "Most vocational departments are complying with Title IX (Elimination of Sex Bias) (mean = 4.23) and "Co-curricular activities are an important part of the vocational curriculum (mean = 4.21). The items with which superintendents least agreed were: "High academic achievers have a tendency to enroll in this area" (mean = 2.95) and "Students eventually enter the occupation for which they are being trained" (mean = 2.71).

TABLE 2

Attitudes of Superintendents Toward Vocational Agriculture Programs

Item Number	Item	Mean Response
16.	Most vocational departments are complying with Title IX. (Elimination of Sex Bias).	4.23
11.	Co-curricular activities are an important part of the vocational curriculum. (Contests, awards programs, leadership activities).	4.21
8.	The cost of most vocational facilities and equipment is justifiable.	4.18
15.	Vocational training is usually beneficial regardless of the occupation entered after graduation.	4.18
6.	A vocational youth club plays an important part in the development of leadership abilities.	4.14
1.	Vocational teachers are generally well prepared to perform their jobs.	4.13
7.	School release time for special vocational activities is necessary. (Shows, fairs, conferences, contests, workshops, etc.).	4.13
14.	Vocational course work should be followed-up by teacher visits to the student's home.	4.10
9.	Professionalism of most vocational teachers is comparable to that of most other teachers	4.03
2.	Most vocational course content is relevant to the world of work.	3.97
24.	The program provides training for the physically and/or mentally handicapped.	3.89
17.	Most vocational departments have well equipped facilities	3.82
21.	The vocational curriculum provides for additional training through cooperative work-study programs.	3.74
18.	The vocational program has, as a goal, training for specific gainful employment.	3.64
19.	The vocational program should provide continuing education for adults.	3.55
23.	Class scheduling is usually not a problem for those students wanting vocational training.	3.49
4.	Low academic achievers have a tendency to enroll in this vocational area.	3.47
3.	Student demand for this vocational course is high.	3.42
13.	Most vocational teacher's workload is as great as that of most other teachers.	3.38
12.	Due to the nature of their work, vocational teachers should be employed beyond the regular school year.	3.21
20.	Vocational teachers aid students in securing jobs after leaving school.	3.18
22.	Adequate vocational counseling is available from guidance counselors.	3.15
5.	High academic achievers have a tendency to enroll in this area.	2.95
10.	Students eventually enter the occupation for which they are being trained.	2.71

TABLE 3

Attitudes of Supervisors Toward Vocational Agriculture Programs

Item Number	Item	Mean Response
6.	A Vocational youth club plays an important part in the development of leadership abilities.	4.42
11.	Co-curricular activities are an important part of the vocational curriculum. (Contest, awards programs leadership activities).	4.30
15.	Vocational training is usually beneficial regardless of the occupation entered after graduation.	4.30
7.	School release time for special vocational activities is necessary. (Shows, fairs, conferences, contests, workshops. etc.).	4.28
1.	Vocational teachers are generally well prepared to perform their jobs.	4.26
8.	The cost of most vocational facilities and equipment is justifiable.	4.26
9.	Professionalism of most vocational teachers is comparable to that of most other teachers.	4.26
16.	Most vocational departments are complying with Title IX. (Elimination of Sex Bias).	4.11
14.	Vocational course work should follow-up by teacher visits to the student's home.	4.00
2.	Most vocational courses content is relevant to the world of work.	4.00
13.	Most vocational teacher's workload is as great as that of most other teachers.	3.93
24.	The program provides training for the physically and/or mentally handicapped.	3.87
12.	Due to the nature of their work, vocational teachers should be employed beyond the regular school year.	3.81
17	Most vocational departments have well equipped facilities.	3.79
19.	The vocational program should provide continuing education for adults.	3.74
4.	Low academic achievers have a tendency to enroll in this vocational area.	3.71
18.	The vocational program has, as a goal, training for specific gainful employment.	3.57
21.	The vocational curriculum provides for additional training through cooperative work-study programs.	3.55
3.	Student demand for this vocational course is high.	3.54
23.	Class scheduling is usually not a problem for those students wanting vocational training.	3.46
20.	Vocational teachers aid students in securing jobs after leaving school	3.33
22.	Adequate vocational counseling is available from guidance counselors.	2.95
10.	Students eventually enter the occupation for which they are being trained.	2.82
5.	High academic achievers have a tendency to enroll in this area.	2.69

TABLE 4

Attitudes of Principals Toward Vocational Agriculture Programs

Item Number	Item	Mean Response
1.	Vocational teachers are generally well prepared to perform their jobs.	4.23
15.	Vocational training is usually beneficial regardless of the occupation entered after graduation.	4.23
8.	The cost of most vocational facilities and equipment is justifiable.	4.22
9.	Professionalism of most vocational teachers is comparable to that of most other teachers.	4.22
7.	School release time for special vocational activities is necessary. (Shows, fairs, conferences, contests, workshops, etc.).	4.18
16.	Most vocational departments are complying with Title IX. (Elimination of Sex Bias).	4.15
11.	Co-curricular activities are an important part of the vocational curriculum. (Contest, awards programs, leadership activities).	4.11
6.	A vocational youth club plays an important part in the development of leadership abilities.	4.10
14.	Vocational course work should be followed-up by teacher visits to the student's home.	4.06
2.	Most vocational course content is relevant to the world of work.	3.96
17.	Most vocational departments have well equipped facilities.	3.85
13.	Most vocational teacher's workload is as great as that of most other teachers.	3.83
19.	The vocational program should provide continuing education for adults.	3.76
23.	Class scheduling is usually not a problem for those students wanting vocational training.	3.76
12.	Due to the nature of their work, vocational teachers should be employed beyond the regular school year.	3.70
18.	The vocational program has, as a goal, training for specific gainful employment.	3.70
3.	Student demand for this vocational course is high.	3.67
22.	Adequate vocational counseling is available from guidance counselors.	3.66
21.	The vocational curriculum provides for additional training through cooperative work-study programs.	3.56
20.	Vocational teachers aid students in securing jobs after leaving school.	3.52
4.	Low academic achievers have a tendency to enroll in this vocational area.	3.50
24.	The program provides training for the physically and/or mentally handicapped.	3.50
10.	Students eventually enter the occupation for which they are being trained.	3.03
5.	High academic achievers have a tendency to enroll in this area.	2.80

Table 3 shows the ratings assigned to the items by responding vocational supervisors. The items rated highest by this group included: "A vocational youth club plays an important part in the development of leadership abilities" (mean = 4.42), "Co-curricular activities are an important part of the vocational curriculum" (mean = 4.30) and "Vocational training is usually beneficial regardless of the occupation entered after graduation" (mean = 4.30).

The items rated lowest by vocational supervisors were the same as those by superintendents. These items were: "Students eventually enter the occupation for which they are being trained" (mean = 2.82) and "High academic achievers have a tendency to enroll in this area" (mean = 2.69).

Ratings assigned to the 24 items by the sample of secondary principals are presented in Table 4. The items rated highest by principals included "Vocational teachers are generally well prepared to perform their jobs" (mean = 4.23) and "Vocational training is usually beneficial regardless of the occupation entered after graduation" (mean = 4.23).

The items assigned lowest ratings by principals were the same as by the two previous groups. These items included "Students eventually enter the occupation for which they are being trained" (mean = 3.03) and "High academic achievers have a tendency to enroll in this area" (mean = 2.80).

Table 5 shows the respective rankings for the 24 items by the three groups of local administrators. Examination of this table reveals that the ten highest rated items in each of the three lists were exactly the same. The order in which they appear is quite varied, but the items were the same. The two lowest rated items were also the same on all three lists.

In addition, a Spearman Rho correlation coefficient was calculated on the ranking of the 24 items among the three groups of administrators. The superintendents' ranking correlated at .89 with the supervisors' rankings; the superintendents' rankings correlated at .83 with the principals' rankings; and the supervisors' rankings correlated at .86 with the principals' rankings. These findings indicated a highly significant degree of relationship among the groups of administrators on their attitudes toward vocational agriculture programs.

A comparison was made among the three groups of administrators to determine if there were differences in the attitudes that they held toward vocational agriculture programs.

Since two of the groups were total populations and one was a stratified random sample and the use of multiple one-way ANOVA's inflates the "experiment - wise error rate (αe)" similarly to multiple t-tests (Oliver, 1979), a scale of practical significant difference was developed to aid in the analysis of data. The use of scales of practical significance and/or common sense interpretations of data have been suggested by Hays (1963), Gold (1969), and Saladaga (1981). This

TABLE 5

Attitudes of Local Administrators Towards Vocational Agriculture

Item	Rank by Administrator Groups		
	Supt.	Supr.	Prin.
16. Most vocational departments are complying with Title IX (Elimination of Sex Bias).	1	8	6
11. Co-curricula activities are an important part of the vocational curriculum. (Contests, awards programs, leadership activities.)	2	2	7
8. The cost of most vocational facilities is justifiable.	3	6	3
15. Vocational training is usually beneficial regardless of the occupation entered after graduation.	4	3	2
6. A vocational youth club plays an important part in the development of leadership abilities.	5	1	8
1. Vocational teachers are generally well prepared to perform their jobs.	6	5	1
7. School release time for special vocational activities is necessary. (Shows, fairs, conferences, contests, workshops, etc.)	7	4	5
14. Vocational course work should be followed-up by teacher visits to the student's home.	8	9	9
9. Professionalism of most vocational teachers is comparable to that of most other teachers.	9	7	4
2. Most vocational course content is relevant to the world of work.	10	10	10
24. The program provides training for the physically and/or mentally handicapped.	11	12	22
17. Most vocational departments have well equipped facilities.	12	14	11
21. The vocational curriculum provides for additional training through cooperative work-study programs.	13	18	19
18. The vocational program has, as a goal, training for specific gainful employment.	14	17	16
19. The vocational program should provide continuing education for adults.	15	15	13
23. Class scheduling is usually not a problem for those students wanting vocational training.	16	20	14
4. Low academic achievers have a tendency to enroll in this vocational area.	17	16	21
3. Student demand for this vocational course is high.	18	19	17
13. Most vocational teacher's workload is as great as that of most other teachers.	19	11	12
12. Due to the nature of their work, vocational teachers should be employed beyond the regular school year.	20	13	15
20. Vocational teachers aid students in securing jobs after leaving school.	21	21	20

TABLE 5 (Continued)

Item	Rank by Administrator Groups Supt.	Supv.	Prin.
22. Adequate vocational counseling is available from guidance counselors.	22	22	18
5. High academic achievers have a tendency to enroll in this area.	23	24	24
10. Students eventually enter the occupation for which they are being trained.	24	23	23

scale was utilized to determine significant differences in attitudes among the groups of respondents. The scale used to interpret these differences was set as follows:

Degree of Practical Significant Difference	Degrees of Differences In Mean Responses
None or negligible differences	.00 - .25
Slight or low differences	.26 - .50
Substantial differences	.51 - .75
High differences	.76 - above

Table 5 presents those items which were found to have a low or higher degree of practical significant difference. Nine items appear in this table. The item with the greatest difference was number 22, "Adequate vocational counseling is available from guidance counselors." Principals rated it highest (3.66) while vocational supervisors rated the item lowest (2.95) resulting in a substancial difference of .71.

Two other items (numbers 12 and 13) fell into the substancial differences category. These items dealt with extended employment and teachers' work loads and had greatest differences of .60 and .55 respectively. In both cases vocational supervisors rated the items highest and superintendents rated the items lowest.

All other differences that appeared were in the category slight or low differences and can be seen in Table 6.

TABLE 6

A Comparison of Attitudes of Local Administrators Toward Vocational Agriculture

Item Number	Item	Mean Response for Each Item			
		Supt.	Supr.	Prin.	G.D.P.S.D.[a]
22.	Adequate vocational counseling is available from guidance counselors.	3.15	2.95	3.66	.71**
12.	Due to the nature of their work, vocational teachers should be employed beyond the regular school year.	3.21	3.81	3.70	.60**
13.	Most vocational teacher's workload is as great as that of most other teachers.	3.38	3.93	3.83	.55**
24.	The program provides training for the physically and/or mentally handicapped.	3.89	3.87	3.50	.39*
20.	Vocational teachers aid students in securing jobs after leaving school.	3.18	3.33	3.52	.34*
6.	A vocational youth club plays an important part in the development of leadership abilities.	4.14	4.42	4.10	.32*
10.	Students eventually enter the occupation for which they are being trained.	2.71	2.82	3.03	.32*
23.	Class scheduling is usually not a problem for those students wanting vocational training.	3.49	3.46	3.76	.30*
5.	High academic achievers have a tendency to enroll in this area.	2.95	2.69	2.80	.26*

[a] G.D.P.S.D. = Greatest Degree of Practical Significant Difference
*Slight or low differences
**Substantial differences

Conclusions

The reported findings served as the basis for formulating the following conclusions:

1. The three groups of local administrators were generally similar in their attitudes toward vocational agriculture programs. Item ranks were highly correlated among the three groups of administrators, and only three items had substantially significant differences in mean ratings.

2. Local administrators felt generally positive about vocational agriculture programs and teachers. All three groups agreed (rating of 3.50 or higher) with the following statements such that they were ranked high among the 24 items: "The cost of most vocational facilities is justifiable," "Vocational training is usually beneficial regardless of the occupation entered after graduation," and "Vocational teachers are generally well prepared to perform their jobs."

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STATUS AND IMPORTANCE/SUPPORT FOR SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS(SOEP) AS PERCEIVED BY NEW YORK VOCATIONAL AGRICULTURE TEACHERS AND THEIR ADMINISTRATORS

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INTRODUCTION/NEED FOR THE STUDY

Supervised occupational experience programs (SOEP) are a primary program component in need of improvement (Miller, 1983; Williams, 1983). A national workshop was conducted in July of 1982 for the purpose of improving SOEP nationwide. The challenge directed to individual states from the national workshop was to initiate efforts which would improve the quality of SOEP programs in their state and contribute to high quality programs at the national level. Boyle (1981) noted that an assessment of the current situation is an important component of program improvement/development. The attitude of program administrators and teachers (Stewart, Lighari, Gett, 1983) are important variables to investigate when reviewing agricultural education program components.

Guidelines, implementation strategies and resource materials for SOEP were developed and field tested for the Northeastern United States (Berkey and Sutphin, 1983) as part of a Cornell based Hatch funded regional research project. Information was needed to adapt these guidelines, implementation strategies and resource materials for use in New York State. Data on the status of SOEP, and the attitudes of administrators and teachers toward SOEP were needed as a basis for planning the implementation of these materials in New York State. Teacher educators, State Education Department staff and leaders of the State agricultural teacher's association (ATANY) in New York State are cooperatively planning the implementation effort.

Hence this research was needed to provide data for planning activities to strengthen agricultural SOEP in New York State.

OBJECTIVES OF THE STUDY

The purpose of the study was to determine the status of agricultural supervised occupational experience programs in New York State, and the attitudes of agricultural teachers and their building administrators toward SOEP. This information will then be used to operationalize guidelines, implementation strategies and resource materials to improve SOEP in New York State.

The specific objectives were to:

1. Describe background characteristics and demographic data concerning agricultural SOEP.

2. Determine the perceptions of agricultural teachers and their building administrators on the benefits, current practices, and the importance/support of selected factors related to SOEP.

3. Compare the perceptions of agricultural teachers and their building administrators with regard to the benefits of SOEP in agriculture, and current practice and importance/support of selected factors related to a high quality SOEP.

METHODOLOGY AND PROCEDURES

Research Design

The research design was a form of the one-shot case study described by Campbell and Stanley (1963). The type of research was descriptive-correlational.

Population and Sample

The population for the study consisted of (a) New York secondary vocational agriculture teachers (N = 333) and (b) their building administrators (N = 210). The list of agriculture teachers was taken from the 1982-83 New York State Directory of Agriculture Programs and Teachers as compiled by the State Education Department. The list was validated by State Education Department Staff, the Director of the Cornell Instructional Materials Service, three agricultural education faculty members at Cornell University, and by follow-up phone calls when the status of prospective respondents was questionable. The title "building administrator" was used for the population of administrators in schools where agriculture was taught since there was no list of individual administrator names available. The total population of agriculture teachers and their building administrators was used as the sample for study.

Data Collection

Separate instruments were developed for vocational agriculture teachers and administrators based on a literature review and the objectives of the study. The teacher questionnaire consisted of questions on: (a) type of school; (b) teacher background in vocational agriculture, teaching experience and certification status; (c) type and scope of school laboratory facilities; (d) percentage of students in FFA; (e) type and scope of SOEP conducted; (f) teacher attitude toward the value of SOEP; and (g) current practice and importance regarding SOEP factors. The building administrator questionnaire addressed only: (a) their attitude toward the value of SOEP; and (b) current practice and their future support regarding SOEP factors. "Importance" ratings by teachers were in terms of conducting high quality SOEP. Future "support" ratings by administrators indicated importance in the context of funding and implementing the factors associated with SOEP. A likert type scale was used for rating importance/support for items on the questionnaire.

Items on the teacher and administrator questionnaires were matched to allow for correlation of data between the two respondent groups in the statistical analysis procedures. Data were collected at either the nominal and interval levels to meet the objectives of the study. Respondents were assured that their individual responses would be kept confidential.

Content validity of the instruments was determined through review by a panel of experts. A Cronbach's alpha reliability coefficient was calculated for individual sections of each instrument. The Cronbach's alpha values for reliability were .85 and .89 for the agriculture teacher instrument, and .76 and .91 for the administrator questionnaire.

Questionnaires were mailed to the total population of New York vocational agriculture teachers and their building administrators. Two follow-up letters were mailed to respondents at two week intervals following the initial mailing. The response rate for teachers and administrators was 61% (202) and 62% (131), respectively.

A follow-up of non-respondents determined that they differed from respondents in one or more of the following characteristics; (1) did not consider their program to be part of agriculture (e.g. ornamental horticulture), (2) did not have SOEP, and/or (3) were located in the New York City area. The findings, conclusions and recommendations of this study must be interpreted in the context of these differences.

Data Analysis

Descriptive and inferential statistics were used to analyze the data. The Statistical Package for the Social Sciences was the computer program used for data analysis.

RESULTS: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Findings

Teacher Characteristics

Over one-half (53.5%) of teachers responding taught farm production and management. The other specializations were represented in the approximate percentage that they represented of the total number of teachers in New York State. Small animal care (3.5%), horse handling and care (2%) and applied agricultural science and mechanics (1%) represented less than seven percent of respondents. The balance of agricultural specializations was distributed among the specializations of ornamental horticulture (15.8%), agricultural mechanization (13.9%) and conservation (10.4%).

Slightly less than half (47.5%) of teachers took vocational agriculture in high school. Of teachers taking agriculture, 96% were FFA members and 80% had some type of SOEP as a part of their agriculture program. As a percentage of all 202 teachers responding, only 46% were FFA members and 38% had SOEP.

Most of the teachers had at least six years of teaching experience. Sixty-two percent had six or more years of total experience, and 60% had six or more years in their present school. Almost one-half of teachers responding (49%) had 10 or more years experience at their present school.

In terms of college work related to SOEP, 18.3% of teachers had a college course on SOEP plus a course including SOEP. Of the remaining teachers, 40.1% had only a course including SOEP, 36.6% reported having no college course on SOEP, and five percent did not respond to the question. In summary, more than one teacher in three had taken no college instruction on conducting SEOP.

Three-quarters (74.8%) of teachers responding had permanent certification. Of the remainder, 20.3% had provisional certification, 3.5% held a certificate of default, and 1.5% did not respond to the question.

Program Characteristics

As could be anticipated, most schools (87.6%) have shops and over one-half (58.4%) have land laboratories. Approximately one-third have greenhouses and/or forestry woodlots. The 30 schools reporting other types of laboratory facilities listed private and rented facilities, sugar maple groves for maple syrup, sawmills, and nearby home farms.

The percentage (4.5%) of schools that reported having large animal laboratories means that the secondary students enrolled in farm production and management had limited in-school opportunity for SOEP with large animals despite New York State production agriculture having dairy as the largest enterprise.

More than one teacher in six (17.3%) reported having no students enrolled in FFA. Similarly, 16.8% reported less than 50% FFA membership. Almost one-half of teachers (46%) reported 100% FFA membership and the balance (20.4%) reported membership between 51% and 99%.

Status of Supervised Occupational Experience Programs

Only one-fourth (25.7%) of teachers reported having a written policy on SOEP. Of the 52 teachers with plans, 45 (86.5%) reported their plans had the approval of the school administration.

Table 1 shows that the number of programs with some level of SOEP increased from approximately one-half in grade nine to approximately 90% in grade 12. However, as shown in Table 2, the percentage of student participation did not increase accordingly.

Table 1

Number Of Teachers Reporting
SOEPs By Grade Level (N=202)

Grade Level	Programs W/O SOEP		Programs With SOEP		Total
	F	%	F	%	%
Nine	97	48	105	52	100
Ten	78	38.6	124	61.4	100
Eleven	16	7.9	186	92.1	100
Twelve	21	10.4	181	89.6	100

F = Frequency

The data in Table 2 shows two trends. First that the total number of students enrolled in Grade 11 increased almost one-half over grade 10, and then dropped back to a 15% increase in grade 12. This could be explained by students entering area occupational centers in grade 11, and/or grade 12 classes typically being smaller than grade 11 due to attrition.

Table 2

Student SOEP Status
By Grade Level

Grade Level	Total Students in Class	Students W/O SOEP		Students With SOEP		Students Completing 300+ Hours	
	F	F	%	F	%	F	%
Nine	1685	886	52.6	799	47.4	535	31.8
Ten	1656	884	53.4	772	46.6	518	31.3
Eleven	2382	1621	68.1	761	31.9	547	23.0
Twelve	1897	1253	66.1	644	43.9	504	26.6
Total	7620	4644	60.9	2976	39.1	2104	27.6

F = Frequency

The second trend was that the overall percentage of students with some level of SOEP ranges from a low of 31.9% in grade 11 to 47.4% in grade 9. A related trend was that the percentage of students with SOEP of 300 or more hours is 23% for grade 11 and 31.8% in grade nine.

Overall, less than three out of 10 (27.6%) agriculture students enrolled in courses reported by teachers had an SOEP of 300 or more hours. Data on non-respondents indicated less SOEP activity than respondents which means that the percentage for all students completing SOEPs with 300 plus hours is probably even lower than 27.6%.

Data on the category of individuals who made visits to students' SOEP work sites showed that over half (56.9%) of visits are made by the teacher who had the student in class. The next highest category was visits by the cooperative education coordinator at 13.9%. Almost one-fourth (23.3%) of teachers did not make any SOEP visits.

Teachers varied in the types of units on SOEP taught in class. The relationship between classroom instruction, the FFA and SOEP was taught by slightly more than one-half (55.4%) of teachers. Other units on SOEP planning and selection were taught by approximately one-third of teachers. One-third (33.7%) of teachers did not respond to the question at all.

The record book most commonly used by teachers for SOEP was the New York book published by the Cornell Instructional Materials Service followed by the books from the National FFA Supply Service, French Bray and Interstate. Almost one-third (31.2%) of teachers reported using no record book, and 14.4% did not respond to the question.

Data were collected on the average number of visits made to students' SOEP during the school year and the summer. Slightly over three out of 10 (30.7%) students received one visit during the school year and 25.7% received more than one visit. In contrast, during the summer only 18.8% of students received one visit, and 24.3% received more than one summer visit. The percent of students receiving no visits at all was 30.2%. The percent of teachers not responding to the question was 13.4% for the school year and 26.7% for summer.

Data were collected on how far the most distant student's home was from the school to provide an idea of maximum travel distance for home based SOEP. Approximately one-third (33.6%) of teachers reported students living within 10 miles, 35.2% of teachers had all students living within 20 miles, and 31.2% of teachers had students living more than 20 miles from school.

The percentage of the course grade allocated to SOEP provides an indication of the importance of SOEP in the vocational agriculture program. Approximately four out of 10 (41.6%) teachers did not include SOEP as part of the course grade. One-fourth (25.8%) assigned one to 10% of the total grade for SOEP. Only 15.8% of teachers assigned 11-20%

of grades for SOEP, and 5.9% grade 21% or more on SOEP. The percentage of teachers not responding to the question was 9.9%.

An annual summary of SOEP was completed by only 5.9% of teachers. Of the remainder, 84.7% responded that they had not made a compilation of student SOEP activities and 9.4% did not respond. All teachers who compiled an annual summary filed such with their school administration.

Teacher Competence in SOEP

Teachers were asked to assess their need for additional competence in SOEP. One-half of the teachers indicated a "High or Medium need" for additional competence in SOEP. Approximately one-third (36.1%) reported "Low or No need", and 13.9% did not respond.

Benefits of SOEP in Agriculture

Teachers and administrators independently rated the benefits of SOEP on a five point likert type scale (1="Strongly Agree" to 5="Strongly Disagree"). Mean scores for both teachers and administrators were computed for the four benefit statements.

Teacher and administrator ratings were similar for three of the four benefits related to SOEP. These three statements were concerned with development of favorable work attitudes, values and habits; development of technical knowledge and skills; and general benefits to the vocational agriculture program, school and community. Teacher means were 4.2 for all three benefits, and administrator ratings were 4.2, 4.2 and 4.3 respectively.

Teachers and administrators differed significantly in their ratings of the fourth benefit statement of "SOEP as well as FFA and in-class instruction is necessary for a high quality vocational agriculture program." The mean teacher rating was 3.2 as compared to the administrator rating of 4.2. An independent T-Test applied to the data indicated a significant difference on the fourth benefit factor at the .05 level (T=2.66 and P=.0008). No significant differences were found on the first three benefits related to SOEP.

Current Practice and Importance/Support of SOEP Factors

Teacher and administrator responses to current practice, and to importance (by teachers) and support (by administrators) of SOEP factors are presented in Table 3. Both teachers and administrators rated current practice for the 12 SOEP factors on a "Yes" - "No" basis. Teachers also rated the importance of the factors on a four point likert scale ranging from "Not Important" (1) to "Essential" (4). Similarly, administrators rated their support for the factors on a four point scale of "No Support" (1) to "Strongly Support" (4). The "importance" and "support" scales were assumed equivalent for the purposes of analysis in this study. Chi-square values were calculated to determine if significant differences existed between teacher and administrators on current practice ("Yes" or "No" responses) for the SOEP factors. Statistical

Table 3

Percentage of Teacher and Administrator Responses to Current Practice, and Importance/Support of Factors Related to SOEP

		Current Practice (%)			Importance/Support (%)				
Factor		Yes	No		NI NS	LI LS	I S	E SS	NR
Participation in SOEP is a requirement for all agricutlture students	T	12.4	81.2	6.4	5.0	27.7	35.1	10.4	21.8
	A	19.11	72.5	8.4	8.4	24.4	37.4	17.6	12.2
Students are informed of the SOEP requirement before they enroll in agriculture	T	25.2	64.4	10.4	8.9	26.4	28.7	11.4	24.3
	A	38.2	48.1	13.7	13.1	14.5	42	23.7	16.8
One class period is provided to the teacher for supervision	T	6.9	83.7	9.4	8.9	14.4	33.2	17.8	25.7
	A	12.2	72.5	15.3	18.3	24.4	21.4	14.5	21.4
More than one period is provided for SOEP supervision when justified by enrollment	T	16.8	69.3	13.9	8.9	15.8	29.7	15.8	29.7
	A	17.6	67.2	15.3	19.1	21.4	32.1	9.2	18.3
A school vehicle is provided for supervision	T	39.6	49.5	10.9	6.9	14.9	32.2	17.8	28.2
	A	44.3	45.8	9.9	10.7	16.0	38.2	18.3	16.8
Mileage reimbursement is provided for SOEP supervision travel	T	42.1	43.6	14.4	5.0	10.4	29.2	22.8	32.7
	A	48.9	37.4	13.7	6.1	9.9	36.6	28.2	19.1
Summer employment is provided for SOEP supervision	T	41.6	51.0	7.4	5.0	6.9	21.8	39.6	26.7
	A	40.5	50.4	9.2	13.0	9.9	32.1	26.0	19.1
SOEP opportunities are provided to all students including the disadvantaged and handicapped	T	51.3	36.6	11.9	3.0	11.4	40.6	18.8	26.2
	A	60.3	26.0	13.7	3.1	6.1	47.3	28.2	15.3
Coordination with guidance counselor to accommodate student student SOEP	T	24.8	65.8	9.4	6.9	14.9	37.1	14.4	26.7
	A	48.9	38.9	12.2	7.6	13.0	41.2	18.3	19.8
Additional credit toward graduation to be given to students who have more than 300 hours SOEP each year	T	22.8	68.8	8.4	11.8	17.8	35.1	7.4	28.2
	A	17.6	57.9	14.5	13.7	23.7	29.0	13.7	19.8
New guidance or administrative personnel are oriented on SOEP	T	10.9	79.7	9.4	7.4	15.3	33.7	13.9	29.7
	A	16.8	70.2	13.0	6.9	18.3	41.2	16.0	17.6
Annual SOEP review/report is conducted	T	9.4	72.3	18.3	8.9	14.9	32.7	7.9	35.6
	A	33.6	55.0	11.5	3.8	16.0	45.8	17.6	16.8

T = Agriculture Teacher; A = Administrator; NR = No Response
Administrator questionnaire coding NS=No Support(1); LS=Limited Support(2); S=Support (3); SS=Strongly Support (4)
Teacher questionnaire coding NI=Not Important (1); LI=Limited Importance (2); I=Important (3); E=Essential (4)

Table 4

Means, Standard Deviations and T-Values on the Importance/Support of SOEP Practices by Agriculture Instructors and their Administrators

	Ag. Teacher			Building Administrator			
Factor	mean[(a)]	S.D.	n	mean[(b)]	S.D.	n	T-Value
Participation in SOEP is a requirement for all agriculture students	2.65	.789	158	2.75	.892	115	-0.77
Students are informed of the SOEP requirement before they enroll in agriculture	2.56	.867	153	3.03	.781	109	-4.48[c]
One class period to provide to the teacher for supervision	2.81	.939	150	2.41	1.043	103	3.17
More than one period is provided for SOEP supervision when justified by enrollment	2.75	.949	142	2.38	.968	107	2.97
School vehicle is provided for supervision	2.85	.908	145	2.77	.939	109	.66
Mileage reimbursement is provided for SOEP supervision travel	3.04	.890	136	3.08	.880	106	-0.34
Summer employment is provided for SOEP supervision	3.31	.902	148	2.88	1.039	106	3.54[c]
SOEP opportunities are provided to all students including the disadvantaged and handicapped	3.02	.758	149	3.19	.720	111	-1.82
Coordination with guidance counselor accommodate student SOEP	2.80	.862	148	2.88	.874	105	-0.65
Additional credit toward graduation to be given to students who have more than 300 hours SOEP each year	2.54	.882	145	2.53	.971	105	.04
New guidance or administrative personnel are oriented on SOEP	2.77	.889	142	2.81	.848	108	-.34
Annual SOEP review/report is conducted	2.62	[illegible]	130	2.93	.766	109	-2.90[c]

a = Teachers rated each statement on a 1-4 scale (1 = "Not important" to 4 = "Essential")
b = Administrators rated each statement on a 1-4 scale (1 = "No support" to 4 = "Strong support")
c = Significant at .05

comparisons of teacher and administrator mean ratings for importance/support using independent T-Tests were also calculated and are included in Table 4.

Current Practice for SOEP Factors - Teacher and administrator "Yes" or "No" responses for current practice for four of the 12 SOEP factors were found to be significantly different as determined by Chi-Square tests at the .05 probability level. The four factors were: students being informed in advance of the SOEP requirements; SOEP opportunities being available to all students including those with special needs; coordination with guidance counselors on SOEP; and conducting an annual report/review.

Other findings on current practice (Table 3) were that only 12.4% of teachers required SOEP for all students, and 25.2% informed students about SOEP before enrollment in agriculture. Only 23.7% of teachers had one period per day or additional released time for SOEP supervision, and approximately 40% of teachers had access to a school vehicle or received mileage reimbursement for SOEP visits.

Summer employment was reported by 41.6% of teachers, but only 17.8% reported being hired 21 or more days during the summer period. Opportunities for SOEP by all students was reported by 51.5% of teachers and 60.3% of administrators. More administrators (48.9%) than teachers (24.8%) reported coordination with guidance counselors to accommodate student SOEPs as a current practice. Similarly, 33.6% of administrators compared to only 9.4% of teachers reported that an annual review/report of SOEP is written.

Although not directly related to the objectives of the study, an interesting finding was that the percentage of both teachers and administrators not responding (NR) to current practice for the 12 factors was lower in every case than their level of non-response to the same items for importance/support (Table 3). For example, on SOEP factor one, 6.4% of teachers did not respond to current practice and 21.5% did not answer the importance rating. This may be explained by "current practice" being an issue of fact where "importance" and "support" responses involved judgements and assumptions for the future.

Importance/Support of SOEP Factors - As shown in Table 4, mean scores for the practice "students are informed of the SOEP requirement before they enroll in agriculture class" were 2.6 and 3.0 for teachers and administrators, respectively. Conversely, teachers rated the importance of "employed during the summer for SOEP supervision" higher than did administrators with mean scores of 3.3 and 2.9 respectively. Administrator mean score ratings were 2.9 for the importance of conducting an annual review/report of SOEP while the mean score for teachers was 2.6. All mean scores were at the 2.5 level or higher for teachers and 2.9 or higher for administrators.

Significant differences between teacher and administrator importance/support ratings (.05 level using the independent T-Test) were found to exist on three of 12 SOEP factors which were "Students are informed of the SOEP requirement before they enroll in agriculture class"; "The agriculture teacher is employed during the summer for SOEP supervision"; and "An annual review/report by SOEP in agriculture is conducted by the agriculture teacher and filed with the administration."

Conclusions

Based on the findings from the data the following conclusions were formulated. The reader is reminded that non-respondents were different from respondents in some respects as previously described in the section on follow-up non-respondents.

1. A majority of New York vocational agriculture teachers lack the experience of having conducted SOEP as part of their high school education and thus must depend on preservice and/or inservice education or other experiences to provide them with the competencies needed to conduct SOEP as part of their students' vocational agriculture program.

2. More than one-third of New York vocational agriculture teachers have not received SOEP related instruction for college credit through either pre-service or inservice teacher training programs. Therefore, inservice education on SOEP is needed.

3. School laboratories are potential viable sources of in-school type SOEP since over 50% of the schools had land laboratories and more than one-third had either greenhouses or forestry plots.

4. Incentive programs are available to New York State vocational agriculture students to encourage participation in SOEP through the FFA national awards program since more than 80% of the schools have FFA programs.

5. New York vocational agriculture teachers can strengthen their SOEP programs by development of, and administrative approval for, written policies on SOEP. Only 25% have written policies/plans for SOEP.

6. Vocational agriculture teachers are more likely to include SOEP as part of the agricultural education program in grades 11 and 12 than in grades 9 and 10.

7. The low (less than 19%) number of New York vocational agriculture students completing SOEP of more than 300 hours a year should be increased to improve the quality of SOEP in the state.

8. Record keeping for SOEP is not stressed in New York vocational agriculture programs nor is there one standard record book used by all departments.

9. Administrators and agriculture teachers have similar views that benefits result from conducting SOEP, although administrators perceive that SOEP is more important for a quality vocational agri-

culture program than do agricultural teachers. Thus teacher attitude may need to be changed before SOEP quality can be increased.

10. School administrators are supportive of SOEP, although, they are less supportive of practices that call for an outlay of expenditures.

11. Agriculture teachers perceive SOEP as important; but are less supportive of practices that deal with summarizing SOEP data and filing annual reports.

12. The SOEP component of vocational agriculture in New York State needs to be improved in order to meet the standards specified in "A Guide For Implementing Standards For Quality Occupational Programs In Agricultural Education, 1979".

Recommendations

The following recommendations are made based on the findings and conclusions for this research:

1. The preservice teacher training program in New York should be reviewed to determine if SOEP competencies are being developed, and appropriate action should be taken based on this analysis.

2. A comprehensive inservice program to develop needed SOEP competencies should be planned and implemented in New York State which would address:

   a. Opportunities for school based SOEP

   b. Relationship of SOEP and FFA and related incentives through FFA

   c. Procedures to develop written policies regarding SOEP and obtaining administrative approval of these policies

   d. Opportunities for SOEP in grades 9 and 10

   e. Teacher lesson plans that are needed to implement SOEP

   f. Development of teacher competence in SOEP record keeping

   g. Importance of coordinating and communicating SOEP activities with school administrators and guidance counselors.

3. Alternative options to implement inservice SOEP activities should be explored including cooperative efforts between the state education department, the Agricultural Teachers Association of New York, and Cornell University.

4. A study should be conducted every two years in order to monitor trends in SOEP in New York State.

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RELATIONSHIP OF VOCATIONAL AGRICULTURE STUDENT SATISFACTION TO SELECTED STUDENT, SCHOOL, AND PROGRAM VARIABLES

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INTRODUCTION

There has been a significant trend in recent years to reduce government spending in many areas. In this atmosphere of retrenchment, accountability has taken on new importance for vocational educators. With the increasing emphasis on accountability, legislators, educators, and the general public are asking if expenditures for vocational education are producing desired results. Funding agencies are asking for evaluative information upon which to base policy decisions. Moreover, a review of the Vocational Education Amendments (1976) makes it clear that the authors of the legislation expect evaluation of vocational education programs to yield data useful in formulating on-going and future policy and program decisions. Valid and reliable data regarding the effectiveness of vocational agriculture/agribusiness programs in Florida are not available.

A generally accepted source of evaluative data for vocational education programs is the graduates of those programs. It is important to have an understanding of the level of satisfaction program participants have with the competencies developed while enrolled in vocational agriculture. This was the focus of the study.

OBJECTIVES OF THE STUDY

Specifically, the study was designed to:

1. Describe selected demographic characteristics of senior vocational agriculture students in Florida high schools.

2. Appraise participant satisfaction with the competencies developed as a result of participating in the vocational agriculture program.

3. Identify student, school, and program variables related to program participant satisfaction.

METHODS AND PROCEDURES

Population Investigated

The population for this study consisted of all high school seniors enrolled in Florida Agribusiness and Natural Resources Programs during the 1982-1983 school year. In November, 1982, each of the 333 senior high school Agribusiness and Natural Resources teachers of Florida was asked to have each senior vocational agriculture student complete a brief questionnaire that identified the student's name, address, telephone number, and the number of years enrolled in vocational agriculture. Two follow-up contacts resulted in 93 percent of the teachers responding. Slightly over 1800 senior vocational agriculture students were identified to form the accessible population.

A random sample of 385 students was selected from the accessible population using a table of random numbers. The required sample size was determined based on a recommended sample selection table (Yamane, 1967). A total of 312 questionnaires was completed for an 82 percent response rate. The most frequent reasons for not being able to reach students via the telephone were "moved to another state", "telephone disconnected", and "joined the military".

Ten randomly selected non-respondents were contacted and asked to respond to selected items on the questionnaire. An analysis of this information revealed no significant differences between respondents and non-respondents.

Instrumentation

In order to obtain requisite information, a telephone interview questionnaire was developed to obtain data from high school seniors. An instrument used in a southern region follow-up study (Iverson and Brown, 1979) assisted in forming a basis for many of the items included.

The validity of the content of the instrument was established by a jury of selected staff members and graduate students in the Department of Agricultural and Extension Education in the College of Agriculture, the College of Education's Department of Administration and Supervision, and selected State Department of Education personnel. The instrument was field tested on a group of twenty senior vocational agriculture students who were not included in the random sample. The information from the field test was used to check the clarity of instructions, appropriateness of questions, and other factors that might affect the response rate. Field testing yielded a reliability coefficient of .87 on the questionnaire.

Data Collection Procedures

Data for the study were collected between March 18, 1983 and March 23, 1983. Eight interviewers were trained to conduct the telephone surveys. The researchers were present at all times during the interview process. Most contacts were made during the evening hours.

Data Analysis

Data were transferred from the completed questionnaire to IBM cards by the University of Florida Data Processing Center. Descriptive statistics were utilized to summarize the items related to student, school, and program variables.

To determine if there was a relationship between satisfaction and student, school, or program variables, each of the program evaluation statements was first examined by factor analysis. Three categories of evaluation statements were identified. A multiple regression was utilized to examine the relationship between the categories of evaluation statements and the demographic variables.

FINDINGS

Personal Characteristics

Eighty-one percent of the respondents were male and ninety-two percent were white. Approximately one-fourth (24.7 percent) of the respondents had been enrolled in vocational agriculture for four years while 62 (19.9 percent) students had been enrolled in vocational agriculture for five years. Approximately equal numbers (22 percent) had been enrolled in vocational agriculture for either two years or three years. Most respondents indicated that they were seventeen years of age.

The largest portion of the respondents (39 percent) lived on one acre or less. There were 87 (28 percent) students who lived on one to five acres while 70 (22.6 percent) lived on five to fifty acres. There were only 32 students who lived on more than 50 acres. However, when asked if they were from an agricultural background, 71.7 percent responded yes. As far as parental occupation, only 50 (16.1 percent) of the students indicated that their mother worked in an agricultural occupation and 91 (29.4 percent) indicated that their father worked in an agricultural occupation.

Each student surveyed was asked to indicate what they planned to do upon graduation from high school. A small percentage of students indicated that they planned to farm after graduation. Table 1 illustrates that only 2.6 percent of the students indicated that they planned to farm upon graduation from high school. There were 35 (13.9 percent) students who indicated that they planned to work in some agricultural occupation other than farming. The largest portion of the students (45.4 percent) indicated that they planned to continue their education after high school either in a post-secondary vocational school or in a college. There were 54 (17.5 percent) students who were uncertain of their plans after graduation.

Table 1

PLANS AFTER GRADUATION
(N = 310)

Plans after graduation	Number	Percent	Cum. Percent
Farm	8	2.6	2.6
Agricultural Occupation	35	11.3	13.9
Non-Agricultural Occupation	30	9.7	23.6
Postsecondary Vocational School	24	7.7	31.3
College	117	37.7	69.0
Military	42	13.5	82.6
Do Not Know	54	17.5	100.0

School Characteristics

Several questions were asked related to characteristics of schools and the programs of vocational agriculture in which the students were enrolled. As far as the size of the school, the largest group of seniors (27 percent) were attending high schools with between 201 and 400 seniors in their senior class. There were 52 (13.5 percent) students attending high schools with less than fifty students in their senior class while 60 (19.3 percent) students attend high schools with more than 400 students in the senior class. The majority (65.9 percent) of the students were in schools with multiple teacher vocational agriculture departments.

Each student was asked to rate the adequacy of the physical facilities for vocational agriculture in their school. The school facilities were divided into three areas including the classroom, shop, and land laboratory. For each of these areas the students were asked to indicate if that part of the facility was poor, fair, good, or excellent. In each case the majority of the students rated their vocational agriculture classroom, shop, and land laboratory as good. Only 2.2 percent of the students rated their land laboratory as poor. Over one-fifth (20.8 percent) of the students indicated that the land laboratory at their school was excellent.

Program Characteristics

The program area with the largest enrollment was production agriculture. Almost one-third (30.3 percent) of the students were enrolled in production agriculture programs. The second largest program area was ornamental horticulture with 27.7 percent of the total enrollment. The smallest program areas were agricultural supplies and agricultural processing.

Program variables related to FFA. Over eighty-five percent of the students surveyed had been a member of Future Farmers of America (FFA) at least one year. Data summarizing FFA membership are presented in Table 2. Of the 146 students who had been enrolled in vocational agriculture for four or more years, 134 (91.8 percent) had been a member of the FFA for four or more years. There were 28 (9.0 percent) students who had been a member of the FFA for only one year.

Table 2

YEARS OF MEMBERSHIP IN FFA
(N = 311)

Year	Number	Percentage	Cum. Percent
0	46	14.8	14.8
1	28	9.0	23.8
2	46	14.8	38.6
3	57	18.3	56.9
4	82	26.4	83.3
5	37	11.9	95.2
6	15	4.8	100.0

When asked about the highest FFA degree earned, 72 (27.1 percent) students said that they had not earned at least a Greenhand Degree while they were a member of the FFA. One-half of the students had reached the Chapter Farmer level while 61 (22.9 percent) had earned only a Greenhand Degree. Each senior was asked to indicate the number of FFA contests above the local level they had participated in during their senior year in high school. Of the 257 students who are currently members of the FFA, 148 (57.8 percent) participated in at least one contest above the chapter level. There were 76 (29.6 percent) students who had participated in three or more contests during their senior year.

Program variables related to the supervised occupational experience program. Sixty-eight percent of the students surveyed had been involved in a supervised occupational experience program (SOEP) for at least one year. Of the 146 students who had been enrolled in vocational agriculture for four or more years, 61 (41.8 percent) had been involved in an SOE program for four or more years. Data summarizing SOE participation are presented in Table 3.

Table 3

YEARS OF PARTICIPATION IN THE SUPERVISED
OCCUPATIONAL EXPERIENCE PROGRAM
(N = 305)

Year	Number	Percentage	Cum. Percent
0	98	32.1	32.1
1	50	16.4	48.5
2	56	18.4	66.9
3	40	13.1	80.0
4	44	14.4	94.4
5	16	5.2	99.6
6	1	.4	100.0

Each student who had been involved in an SOEP was asked to categorize the SOEP as either an ownership program, placement program, or directed laboratory experience program. There were 16 students who had projects that were in two different categories and three students indicated that they had all three types of projects. There were 119 (51.7 percent) students involved in an ownership experience program, and 56 (24.3 percent) students in a placement program. Almost two-thirds of the students indicated that their SOEP would lead to continued income after graduation.

Several questions were asked about the amount of supervision students received with their SOE program. Almost one-third (30.3 percent) of the students involved in SOE indicated that their teacher had not visited their project during their senior year. Over one-half (55.8 percent) of the students had been visited one to six times during their senior year. Students were also asked how many times their teacher had telephoned them regarding their SOEP. Over one-half (59.0 percent) of the studens had not been telephoned about their SOEP.

Another form of project supervision is through record keeping. Over 80 percent of the students surveyed indicated that they maintained record books on their SOEP. Over 75 percent indicated that they had spent class time reviewing their record book. The final question related to SOEP supervison was whether or not their vocational agriculture teacher was available to supervise their SOEP in the summer. Over two-thirds (87.7 percent) of the students indicated that their teacher was available to help in the summer.

Student Attitudes Toward Their Vo-Ag Experiences

The second objective sought to determine participant satisfaction with experiences received in vocational agriculture. Each student rated sixteen statements related to their vocational agriculture experiences. A modified four-point Likert scale was utilized to categorize responses. Students could strongly agree (coded 4), agree (coded 3), disagree (coded 2), or strongly disagree (coded 1) with each of the items. Frequencies, percentages, and a mean response were computed for each statement.

In general, experiences received very high ratings from the seniors. For the statement: "vocational agriculture taught me skills useful in production agriculture", 99.4 percent of the students agreed or strongly agreed. When asked if they would enroll in vocational agriculture if they had it to do over, 96.8 percent of the students responded positively. The item with the least number of students responding positively (agree or strongly agree) was "vocational agriculture helped me choose an occupation". On this statement, 73.4 percent of the students either agreed or strongly agreed. These data may be reviewed in Table 4.

Table 4

RATINGS OF STATEMENTS ABOUT THE VOCATIONAL AGRICULTURE PROGRAM BY SENIOR VOCATIONAL AGRICULTURE STUDENTS IN FLORIDA

(N = 312)

Statements About Vocational Agriculture Experiences	Percentages of Responses				
	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean Response
Taught me skills useful in production agriculture	34.0	65.4	0.3	0.3	3.33
Taught me skills useful in agribusiness and natural resources	24.8	68.6	6.4	0.3	3.18
Helped me learn how to participate in meetings	38.5	54.8	5.8	1.0	3.30
Helped me choose an occupation	21.0	52.4	25.9	0.6	2.94
Helped me develop leadership skills	38.1	54.5	7.1	0.3	3.31
Helped me understand how to enter and advance in agricultural occupations	29.7	63.9	5.8	0.6	3.22
Helped me see the need to get along with others on the job	43.4	53.4	3.2	—	3.40
Helped me learn to work in production agriculture areas like farming, greenhouse production or nursery operations	47.1	51.0	1.9	—	3.45
Helped me learn to work in agribusiness and natural resources areas like sales and service, forestry or food processing	17.9	62.8	17.9	1.2	2.97
Helped me learn to get along with other people	36.3	61.1	2.3	0.3	3.34
Vocational agriculture classes were good for me	46.5	51.9	1.3	0.3	3.44
If I had it to do over, I would re-enroll in vocational agriculture	53.5	43.3	2.9	0.3	3.50

* Coded as SA = 4, A = 3, D = 2 and SD = 1.

Students were in less agreement about teacher assistance received while in vocational agriculture. Responses to four items related to teacher assistance are summarized in Table 5. Approximately 96 percent of the students indicated that their teacher provided them with information on careers within agriculture. Over three-fourths of the students indicated that their teacher encouraged them to attend college.

Table 5

RATINGS OF STATEMENTS ABOUT TEACHER ASSISTANCE IN VOCATIONAL AGRICULTURE BY SENIOR VOCATIONAL AGRICULTURE STUDENTS IN FLORIDA

	Percentages of Responses				
Statements About Teacher Assistance	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean Response*
Encouraged me to enter an occupation in agriculture	28.8	59.6	10.6	1.0	3.16
Encouraged me to consider attending college	27.6	49.7	22.1	0.6	3.04
Provided information on career outside agriculture	15.7	58.0	25.6	0.6	2.88
Provided information on career within agriculture	36.9	59.9	3.2	--	3.33

* Coded as SA = 4, A = 3, D = 2, and SD = 1.

Objective Three

Objective three was designed to identify student, school, and program variables that were related to program participant satisfaction. To accomplish the objective, the sixteen evaluation statements were examined by factor analysis. Categories of evaluation statements (constructs) were identified through factor analysis using the principle components method and a varimax rotation. Variables loading .60 or higher on a factor were considered in interpreting the meaning of the factor.

Three satisfaction factors were identified and are summarized in Table 6. For each factor identified, the factor loading of each questionnaire item is indicated. The three categories of response statements were identified and labeled as: (1) values of the program, (2) instructional program, and (3) career guidance.

Table 6

RESULTS OF FACTOR ANALYSIS OF THE EVALUATIVE RESPONSES

Factor/Item Name	Factor Loading
Factor 1: Values of the Program	
Vo-Ag helped me develop leadership skills	.67
Vo-Ag helped me learn to get along with others	.66
Vo-Ag classes were good for me	.70
If I had it to do over again, I would enroll in vocational agriculture	.62
Factor 2: Instructional Program	
Vo-Ag taught me skills useful in agribusiness and natural resources	.72
Vo-Ag helped me learn to work in production agriculture areas like farming, greenhouse production or nursery operations	.60
Vo-Ag helped me learn to work in agribusiness and natural resources areas like forestry, sales and services or food processing	.68
Factor 3: Career Guidance	
My teacher encouraged me to enter an occupation in agriculture	.70
My teacher encouraged me to consider attending college	.76
My teacher provided me with information on careers within agriculture	.69

To determine if any of the student, school, or program variables were related to the satisfaction factors, a step-wise multiple regression analysis was conducted. The student, school, and program variables were used as the independent variables and the three factors identified by factor analysis were used as dependent variables. A probability level of .05 was used to determine if each independent variable significantly contributed to the explanation of variance in each factor.

For the first factor, values of the program, there were three variables that contributed to the variance: years of participation in SOEP, adequacy of the land laboratory, and teacher availability to supervise SOE programs in the summer. However, these variables accounted for only 13.3 percent of the variance (R^2) in this factor.

For the second factor, instructional program, there were three variables that significantly explained the variance: teacher availability in the summer, years of participation in SOEP, and adequacy of the land laboratory. They explained 11 percent of the variance (R^2) in this factor.

For the third factor, career guidance, there were again three variables that contributed to the variance: years in FFA, adequacy of the land laboratory, and years of participation in SOEP. They explained 17.9 percent of the variance (R^2) in this factor.

CONCLUSIONS AND RECOMMENDATIONS

1. Females and racial minorities are inadequately represented among seniors enrolled in vocational agriculture in Florida in 1983. Continued efforts should focus on communicating opportunities in vocational agriculture to these groups.

2. Students enrolled in vocational agriculture programs in Florida appear to be highly non-farm in nature. It is recommended that program planners focus careful attention on helping teachers design supervised occupational experiences for these students.

3. Almost one-half of the seniors indicated that they planned to continue their education after high school. Findings of Iverson and Brown (1979) and other studies indicate the actural number of students continuing their education is lower. Teachers and guidance personnel must recognize this gap and help students establish post-high school career plans.

4. A small portion (13.9 percent) of the seniors were planning to enter either farming or agricultural/agribusiness occupations immediately upon graduation. It is recommended that a future follow-up study focus on determining the actual number of students who pursue an agricultural/agribusiness occupation or post high school training in agriculture/agribusiness.

5. Most students had been enrolled in vocational agriculture and had been a member of the FFA for more than two years, yet only one-half of the students had progressed through the degree structure to the Chapter Farmer degree. Instruction and leadership should be provided to encourage progress through the degrees.

6. Approximately two-thirds of the seniors had been involved in a supervised occupational experience program while enrolled in vocational agriculture. However, of the students who had been enrolled in vocational agriculture for four or more years only 41.8 percent had been involved in an SOEP for four or more years. Leadership and inservice efforts for teachers must continue to focus on developing a stronger commitment to this aspect of the program in Florida.

7. Teachers are doing a less than adequate job of supervising experience programs. Almost one-third of the seniors with an SOEP indicated that their teacher did not visit the project during their senior year. Efforts should focus on encouraging more active supervision on the part of teachers.

8. Overall, seniors indicated a high degree of satisfaction with the experiences they received in vocational agriculture. Teachers should continue to work for high quality instructional programs.

9. Two variables were related to each of the three satisfaction factors that were identified. These variables were: years of involvement in SOEP and student attitudes concerning the adequacy of the land laboratory. In addition, teacher availability in the summer was related to factor one and factor two. Years in FFA was significantly related to factor three: career guidance. However, it was concluded that these variables were contributing very little to explaning the variance in student satisfaction.

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* This paper was presented at the Tenth Annual National Agricultural Education Research Meeting, December 2, 1983, Anaheim, California.

CRITIQUE

THE PROFESSIONAL PREPARATION, YEARS OF SERVICE AND OCCUPATION ENTERED UPON LEAVING THE PROFESSION BY AGRICULTURAL EDUCATION PERSONNEL IN OHIO: A LOG-LINEAR ANALYSIS

by

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R. Kirby Barrick
J. Robert Warmbrod

PREDICTING WHETHER OR NOT AGRICULTURAL EDUCATION GRADUATES WILL TEACH

by

Jimmy G. Cheek
Max B. McGhee
Gregory West

COMPETENCIES NEEDED TO UTILIZE MICROCOMPUTERS IN VOCATIONAL AGRICULTURE

by

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INTRODUCTION

The role of a research discussant is to identify major strengths of the research reported and to offer suggestions for improving the research. To provide a general framework for identifying strengths and to offer suggestions for improvement, answers to the following general questions were sought.

1. Was the problem studied important to the profession, and were appropriate objectives, hypotheses or research questions identified to guide the investigation?

2. Were appropriate procedures used to obtain information needed for answering the questions or testing the hypotheses?

3. Are the results based on an appropriate analysis of the data and are the results presented in an appropriate format?

4. Are the conclusions developed substantiated by the data collected?

5. Are there suggestions for improving the paper prior to publication?

Answers to these questions are based solely upon a review of the manuscripts provided prior to the conference.

THE PROFESSIONAL PREPARATION, YEARS OF SERVICE AND OCCUPATION ENTERED UPON LEAVING THE PROFESSION BY AGRICULTURAL EDUCATION PERSONNEL IN OHIO: A LOG-LINEAR ANALYSIS

The first two papers presented relate to the same general topic, preparation and retention of vocational agriculture teachers. There is perhaps no topic in our profession that is more important than the education and development of quality vocational agriculture teachers. The recent literature in education emphasizes excellence in education and the key to a quality educational program--qualified teachers.

The first paper examines what occupational areas vocational agriculture teachers enter after leaving the teaching profession and various associated factors. As compared to other studies completed in recent years, this study includes the factor, type of professional program completed, in the data analysis related to teacher turnover. Specific comments regarding the paper follow.

- The introduction provides information why in Ohio it is important to consider the factor, type of preparation program completed, in relation to teacher turnover. I doubt whether most states have as large a proportion of vocational agriculture teachers recruited from business and industry.

- Although the data indicate why it is important in Ohio to consider the factor, type of preparation program completed, no theoretical base was established through a review of literature. I would suggest that a review of related literature in trade and industrial education or a review of such works conducted by Lortie and Charters would add a more definitive basis for the study. This recommendation is made especially to improve the paper prior to publication.

- The investigators are to be complimented for the very concise manner in which the study objectives were identified. There was no doubt what was being studied, and the findings were presented in a manner directly related to the research questions. In like manner, the authors very distinctly indicate the target population and make it very clear that a census was conducted.

- I commend the authors for selecting appropriate statistical techniques. Based upon the criteria identified by Oliver (1981), log-linear analysis appears to be an appropriate statistical technique. The researcher provides justification for using an alpha level of .10. Additional justification for using an alpha level of .10 is provided when we consider this as part of a larger developmental project. My perception is that too often in our social science research we are tied to the standard alpha levels of .05 or .01. In our developmental work, lets "relax" the alpha level. Granted the chances of making a Type I error are greater, but it may generate some rich information to use in future work.

- Most of my suggestions for improving the paper relate to the findings and conclusions sections. First, the authors conclude that personnel recruited from business and industry tend to return to that occupational area upon leaving the teaching profession at higher rates than professionally prepared personnel. Is a group of people being omitted with these definitions? My question relates to the definition of "people recruited from business and industry." In which group is a person with a degree in a technical area that has been hired directly out of college to teach, and is now completing his certification during the first two years on the job. I assume that person is classified as a person from business and industry. Is there this third group of teachers currently "hidden" within one of the two classifications used in the data analysis?

- In conclusions developed in relation to Table 1, they indicate that area of specialization may be one reason professionally prepared teachers enter farming at higher rates than non-professionally prepared teachers. It would be helpful to provide data to substantiate the statement that professionally prepared data tend to teach production agriculture and non-professionally prepared teachers teach other subjects.

- In the data analysis for the second research question they investigated the relationship between type of preparation and years prior to leaving. Is there an additional factor that should have been evaluated--that factor being reasons for leaving. It would be helpful to know what proportion left by their own choice and what proportion were in fact dismissed and had no choice in leaving the profession. When we examine the data in Table 2, we find a relatively larger number (approximately 7%) of professionally prepared teachers leaving either at the end of one year or after six or more years. Especially with those leaving after six or more years, I personally believe it is more important to know why they left rather than the type of program completed.

- The authors conclude that if teacher education can meet the demands for entering personnel, the non-professional certification program may not be needed. This conclusion is based on data indicating a stabilized annual need for new personnel. With Ohio's certification by taxonomy areas and occupational experience requirements, I wonder whether the non-professional certification program will ever be eliminated. Perhaps if there is a decrease in annual openings for specialized vo-ag programs.

- In the discussion section several key questions are raised by the authors which provide opportunities for future research. With these questions the authors acknowledge the multi-dimensional nature of the problem they are studying. Up until this last section the problem was placed in a unidimensional context. It would be helpful to discuss the multi-dimensional nature of the problem in the introduction to the paper.

PREDICTING WHETHER OR NOT AGRICULTURAL EDUCATION GRADUATES WILL TEACH: A DISCRIMINATE ANALYSIS

As with the previous paper, this study focused on placement of vocational agricultural teachers; more specifically what factors are related to graduates teaching or not teaching. This research represents a developmental study, and some of my comments are thus offered within that context.

- This paper has a sound theoretical basis. The introduction provides evidence of background work to identify appropriate factors to examine in the study. Most of the background work was related to agricultural education research. Perhaps a review of associated work conducted in other disciplines would have given a "hint"of other factors to consider which would more accurately predict whether people teach or do not teach.

- The general study framework and related research questions clearly identified what the study was about. Some individuals may desire to see hypotheses formulated regarding relationships between factors and the outcome measure. In this study we need to remember the investigators are involved in developmental work. Hypotheses may in fact have limited the exploratory nature or "structured rummaging" of data. I don't mean to imply the investigators haphazzardly rummaged through the data. I found it refreshing that they used the research questions to provide a basis for analyzing factors from several perspectives.

- As a reader, some clarification regarding the categories "those who teach" and "those who do not teach" would be helpful. People were classified into one of these two categories based on a contact to determine if they had taken a teaching position the year after graduation. The first question is, "How soon after graduation was this contact made to determine if they had taken a teaching position?" For example, if I graduated at the end of Spring Semester but did not take a teaching job until Spring Semester of the following year, would I be classified as a non-teacher?

- In the paper, it would be helpful to indicate, for the reader, the extent to which graduates had an opportunity to accept teaching positions. The "tone of the paper" leads me to believe that every graduate that "wanted to teach" in fact was able to secure a teaching position immediately after graduation. If you had more graduates than openings, in which category would you place the person that "really wants to teach" but there isn't a position for him/her. Perhaps we need to identify measures other than whether the graduate did or did not take a teaching position when we use, for the most part, measures of psychological constructs as predicter variables.

- The instrumentation used in this study is exceptionally well documented. There is no question how and when questionnaires were administered and tests were completed. The authors present thorough normative information for several of the instruments. With regard to the Tennessee Self-Concept Scale, questions in recent years have been raised regarding the validity of the scale (Robinson and Shaver, 1973). There has been some problem in controlling social desirability types of responses and non-independence of subscores. This may be a contributing factor for the results appearing as they do in Table 11 for the Tennessee Self-Concept Subscales.

- The authors provide us with a great degree of descriptive participant background information. One gets a real feel for the type of graduates involved in the study. The target population is easily identified and well documented.

- The information collected from the various instruments was analyzed to identify major factors for inclusion in the discriminant analysis. The investigators are to be commended for using factor analysis with oblique rotation. Oblique rotation in this study is more realistic, although computationally more complicated. Oblique rotation does not require the factor axes to be uncorrelated. Especially in light of the recent criticism of the Tennessee Self-Concept Scale, it would be difficult to justify an orthogonal rotation. A recommendation for publication of the results in a journal would be to include a display of the factor rotations.

- Since this represents an exploratory type of study, the authors may want to consider "relaxing" the alpha level to .10 (per the previous study). This may identify other factors which may provide a basis for future research.

- The study conclusions and recommendations are based upon the data presented and specifically answer the research questions. I commend them for presenting a well written paper.

COMPETENCIES NEEDED TO UTILIZE MICROCOMPUTERS IN VOCATIONAL AGRICULTURE

The Hudson study explores an area of interest to literally every vocational agriculture teacher--using microcomputers in vocational agriculture programs. He has identified a research area of great interest and importance to the profession.

My specific comments regarding this research paper follow.

- The author indicates this research represents an initial step for identifying microcomputer competencies needed by vo-ag teachers. In the paper, it was indicated this information would be used for planning vo-ag teacher inservice programs, planning preservice programs and planning local vocational agriculture programs. I found a clearly identified general framework for the study, and a description of how the results were to be used.

- Although a general study framework was identified, I would like to see a stronger theoretical base for the study through a literature review. In this paper, no studies or professional writings were presented. Although there may be no such studies in agricultural education, work has been completed in other disciplines which are related to the topic.

- My compliments to the researcher for using the Delphi Technique in collecting data to answer the questions. It appears this technique represents a more appropriate way to identify a core of skills/competencies needed than the typical mailing of one survey questionnaire (Cyphert and Gant, 1969). However, since this paper is well within the space limitations imposed for this conference, it would have been helpful to describe the specific details of each iteration of the Delphi technique.

- One of my major questions relative to this paper involves the sketchy description of the sample. We are told that heads of agricultural education departments were asked to identify individuals that were "familiar with vocational agriculture and had microcomputer expertise." It is not clear whether this pool, from which a panel of 35 experts was selected, included only teacher educators or whether it included local vocational agriculture teachers and supervisory personnel. I would also like to know what percent of teacher educators gave you names of persons for consideration. Are we talking about a potential pool that represents nominations from only 15 department heads or are we talking about a group of nominations from 80 percent of the department heads? It would also be helpful to identify in the paper the specific criteria the investigator used to select the panel of experts. Were they randomly selected from all names submitted by the department heads, or based on some set of criteria, did you eliminate some names then take those that remained as your panel of experts?

- In the methodology and procedures section, I get the "hint" that people you asked to identify the competencies were teacher educators. It is only in the last two sentences of the paper that we discover a "small number of vocational agriculture teachers" were included on the panel of experts. It would be helpful to indicate very early the groups represented on the panel of experts and the relative proportion of the sample each group represented. I guess, I'm asking you to more clearly identify your target population.

- I assume all 35 individuals that served on your panel of experts completed all four phases of the Delphi technique. It would be helpful to know if the percentages reported in Table 1 are based on responses from the original 35 panel of expert members or whether some individuals dropped out.

- The results are presented in a straight-forward manner. I commend the investigator for not attempting to over analyze the data with all kinds of statistics. The frequency analysis presented in Table 1 seems most appropriate, especially with the high degree of consensus that evolved through using the Delphi technique. Barratta (1979) indicates that Delphi results should be reported to reveal both importance and consensus. The use of a model technique to identify priorities appears appropriate in this case where you have a high degree of consensus. However, it is not the typical format for Delphi results. How would you have determined priorities if you would have literally had an equal distribution between the categories? You had indicated earlier in the paper that averages, and perhaps standard deviations, were computed. This information does not appear in the table.

- Dr. Hudson is to be commended for the questions he raises in the paper's discussion section regarding the results. He has raised several "red flags" regarding the ratings for several of the programming competencies. I agree with him that more precise definitions for several competencies may alter the ratings to a large degree.

- My last comment relates to the use of the results for planning preservice and inservice programs. The first conclusion indicates that any competency which had "some level of importance" are the competencies needed to use microcomputers. If I have examined the data correctly, "some level of importance" translates to a "low level of importance" on the scale used in the study. We might question whether the teacher preservice and inservice programs which include instruction for "low level of importance" competencies are warranted. I would suggest we establish a higher criterion for selecting needed competencies.

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THE PROFESSIONAL PREPARATION, YEARS OF SERVICE AND OCCUPATION ENTERED UPON LEAVING THE PROFESSION BY AGRICULTURAL EDUCATION PERSONNEL IN OHIO: A LOG-LINEAR ANALYSIS

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INTRODUCTION

For a number of years, the demand for vocational agriculture teachers at the secondary level in Ohio exceeded the supply. The enactment of the Vocational Education Act of 1963 and its subsequent amendments brought about an expansion of secondary vocational agriculture programs. From 250 teachers in the early 1960's, the vocational agriculture program grew to over 750 local agricultural education personnel in the mid-1970's, including secondary and adult teachers and local supervisors.

In addition to the demand for more teachers due to growth in the number of positions, the need for teachers certified in several specialized instructional areas compounded the problem. Graduates were not immediately available to meet the technical agriculture requirements for certification in such areas as products processing, small animal care or environmental management. Teacher education programs were unable to meet the immediate demand in the number of needed agricultural education personnel.

With changes in state certification requirements, teacher education turned to alternative programs to help supply the state with vocational agriculture personnel. Recruiting persons from business and industry was the alternative adopted by the Ohio Department of Education to help meet the demand for teachers in a short period of time. Those persons possessed the required technical competence in agriculture obtained from a number of years of experience in the industry or from an undergraduate degree in a technical field of agriculture. The professional education preparation was provided during the first two years of teaching.

The growth of this alternative teacher certification program was rapid, providing a total of over 60% of entering personnel in 1976 (Barrick, Wardlow and Warmbrod, 1983). Because the number of personnel recruited from business and industry had grown considerably since the study began in 1970, several questions began to arise regarding the relationship between tenure of agricultural education personnel and their professional preparation. Answers regarding the research questions should be beneficial in determining demand for local agricultural education personnel and assisting teacher educators and others in planning teacher-preparation programs.

OBJECTIVES OF THE STUDY

The following research questions were investigated for those agricultural education personnel who left the profession:

1. What is the relationship between the type of professional preparation of local agricultural education personnel and the occupation entered upon leaving the profession?

2. What is the relationship between the type of professional preparation of agricultural education personnel and the number of years that they remained in the profession?

3. What is the relationship between the occupation entered by agricultural education personnel and the number of years that they remained in the profession?

Several studies have investigated the supply and demand of vocational agriculture teachers including the annual studies that have been conducted by Woodin and Craig. These studies detail the annual demand for vocational agriculture teachers and to what degree the yearly demand has been met in each state. The Woodin and Craig studies have shown that the demand has far exceeded the supply of teachers.

Bender and others have completed follow-up studies of agricultural education graduates periodically, and although these studies provide interesting data regarding agricultural education college graduates, they provide no specific data for those who actually enter teaching. Further, because of the certification procedures implemented in Ohio in the early 1970's, some teachers are not college graduates and, therefore, would not be included in such studies as Bender's and Craig's. No attempt has been made in these studies to identify the type of preparation of the personnel who fill agricultural education positions, the occupations they enter upon leaving the profession, the number of years that they remain in the profession or the relationship between these factors.

METHODS AND PROCEDURES

The population for the study was all local agricultural education personnel in Ohio who entered the profession from the 1970-71 through the 1976-77 school years and had left the profession prior to the 1982-83 school year. Local agricultural education personnel was defined as all secondary and adult teachers and local supervisors of vocational agriculture programs. Data regarding the types of professional preparation and occupation entered upon leaving the profession were collected annually in the fall of each year from 1970 through 1982. The population included 454 persons. The entire population was studied.

The term "professionally prepared" describes personnel who are four-year college graduates of teacher education programs and hold a four-year provisional certificate upon entering the profession. The term "non-professionally prepared" describes personnel who are not graduates of a teacher education program, who may or may not have a college degree, but have occupational experience related to their instructional area.

The data were analyzed using the log-linear analysis program of the BMDP4F package at the Instruction and Research Computer Center of The Ohio State University. Log-linear analysis was selected as the appropriate statistical procedure because the data were in the form of frequencies for each of the variables of interest. Prior to the development of log-linear analyses, chi-square analysis was the commonly accepted procedure used to determine whether observed proportions differed significantly from theoretically derived expected proportions. The chi-square, which is a test of association, is limited to the analysis of only two-dimensional contingency tables. Log-linear analyses allow for testing the association of multiple numbers of variables simultaneously (Kennedy, 1983).

To answer the research questions, likelihood-ratio chi-square values (L^2) were computed using the observed frequencies at an alpha level of .10. Kennedy (1983) cautions that it is somewhat difficult and perhaps unwise to state an exact numerical criterion for statistical significance in log-linear analyses with several variables, because several procedures within the analysis are somewhat conservative in nature.

FINDINGS

Type of Preparation and Occupation Entered Upon Leaving

The log-linear analyses indicate that a significant relationship exists between the type of professional preparation of local agricultural education personnel who left the profession and the occupation entered upon leaving the profession (Table 1). Non-professionally prepared personnel tend to enter business- and industry-related occupations at a much higher rate (55%) than professionally prepared personnel who tend to enter a wider range of occupations including other education-related jobs (16%), farming (30%), business and industry (40%) and other occupations (14%). It should be noted that business and industry is the occupation into which the highest percentages of both professionally- and non-professionally-prepared personnel entered upon leaving.

The data support the conclusion that personnel who are recruited from business and industry and are not professionally prepared tend to return to that occupation upon leaving the agricultural education profession at a higher percentage rate than professionally prepared personnel. Professionally-prepared teachers enter farming upon leaving teaching at a much higher rate than non-professionally-prepared teachers. These differences may be attributed to their area of specialization for teaching. Professionally-prepared teachers tend to be production agriculture teachers; non-professionally-prepared teachers tend to teach subjects other than production agriculture.

Type of Preparation and Length of Tenure

There is a significant relationship between the type of preparation of agricultural education personnel who left the profession and the number of years that they remain in the profession (Table 2). For both the professionally- and non-professionally-prepared personnel who left the profession, approximately 56% left after two, three, four or five years in the profession. Of the professionally-prepared personnel who left the profession, 23% left after the first year and 22% left after six or more years. Of the non-professionally-prepared personnel who left the profession, 29% left after the first year and 14% left after six or more years.

Occupation Entered and Length of Tenure

The relationship between the occupation entered upon leaving the profession and the number of years that agricultural education personnel remain in the profession was not found to be significant (Table 3).

CONCLUSIONS AND IMPLICATIONS

Local agricultural education personnel who left the profession and who are non-professionally prepared tend to leave the profession sooner than professionally prepared personnel and are more likely to return to business- and industry-related jobs. These people enter agricultural education from business and industry, teach for a relatively short period of time and then return to business and industry at a higher percentage than professionally prepared personnel. Further study needs to be done concerning this finding. Why do non-professionally-prepared persons enter agricultural education initially? How do they feel about their professional experience and why do they leave? Do professionally prepared personnel experience greater job satisfaction, and does this aid in the retention of personnel? Is there a difference between each group in their relative effectiveness as agricultural education personnel?

If the total demand for local agricultural education personnel in Ohio declines, the need for alternative types of professional preparation programs may no longer be necessary. Other studies do, however, indicate that the percentage of non-professionally-prepared personnel entering agricultural education positions in Ohio has stabilized at around 45% of the total number of entering personnel annually (Barrick, Wardlow and Warmbrod, 1983).

Since professionally-prepared personnel enter the profession at a higher rate than non-professionally-prepared personnel and non-professionally-prepared personnel remain in the profession for shorter periods of time, then the number of non-professionally prepared personnel in the profession should decline over time.

The conclusion can then be drawn that the annual demand for new personnel should stabilize or slowly decrease as a percentage of the total population of personnel. Other studies (Barrick, et al.) support this conclusion, indicating that the annual demand for entering personnel has approximated 11% for the past 12 years. The contention can then be supported that if teacher education programs can meet these demands for entering personnel, considering future annual decreases in total numbers of positions, then the non-professional certification program may no longer be necessary.

Table 1

Type of Preparation of Agricultural Education Personnel and Occupation Entered Upon Leaving the Profession

Occupation Entered Upon Leaving	Type of Preparation: Professional f	Professional %	Non-Professional f	Non-Professional %
Education related	43	16.2	28	14.8
Farming	80	30.2	24	12.7
Business/industry	105	39.6	104	55.0
Other occupation	37	14.0	33	17.5
Total	265	100.0	189	100.0

Note. $L^2 = 21.65$, which denotes a significant relationship, $\alpha \leq .10$.

Table 2

Type of Preparation of Agricultural Education Personnel and Years in the Profession Before Leaving

Years of Tenure	Type of Preparation			
	Professional		Non-Professional	
	f	%	f	%
One	60	22.6	55	29.1
Two to five	148	55.8	107	56.6
Six or more	57	21.6	27	14.3
Total	265	100.0	189	100.0

Note. $L^2 = 4.71$, which denotes a significant relationship, $\alpha \leq .10$.

Table 3

Years Completed in the Profession Before Leaving and Occupation Entered by Agricultural Education Personnel

Occupation Entered Upon Leaving	Years in the Profession					
	One		Two to Five		Six or More	
	f	%	f	%	f	%
Education related	18	15.6	41	16.1	12	14.3
Farming	26	22.6	56	21.9	22	26.2
Business/industry	58	50.4	114	44.7	37	44.0
Other occupation	13	11.4	44	17.3	13	15.5
Total	115	100.0	255	100.0	84	100.0

Note. $L^2 = 2.90$, which denotes no significant relationship, $\alpha \leq .10$.

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PREDICTING WHETHER OR NOT AGRICULTURAL EDUCATION GRADUATES WILL TEACH

A DISCRIMINATE ANALYSIS

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INTRODUCTION

The shortage of teachers in the field of agricultural education has been well documented (Craig, 1980). This teacher shortage has been aggravated by the fact that a low percentage of certified graduates from agricultural education programs take teaching positions (Craig, 1982; Moss and Briers, 1982). At the University of Florida, only 58 percent of the 1977-1982 agricultural education graduates took teaching positions in the first year after graduation.

Educators have suggested a number of ways to ease the shortage of agricultural teachers. One suggestion has been to provide career guidance which will effectively influence students to enter agricultural education programs (Hillison and Hagee, 1980). A second approach has been to develop measures of teacher morale and teacher satisfaction which will be predictive of agricultural teacher longevity (Kittrell, 1978; Miller, 1977, 1978; Briers and Byler, 1979; White, 1979; Collins and Key, 1982). A third approach to the teacher shortage problem has been to increase the percentage of certified graduates from agricultural education programs who take teaching positions. This third approach requires the identification of screening measures which are predictive of whether a student will teach after graduating from an agricultural education program.

PURPOSE AND OBJECTIVES

The central purpose of this study was to identify screening measures which were predictive of whether a student would teach after graduating from an agricultural education program. In order to be effective screening measures, the data must be collectible before admission into the agricultural education program. Although the Purdue Student-Teacher Opinionnaire (PS-TO) in this study was collected immediately after the student teaching term, the PS-TO was included in the study since a motivation/morale measure could be collected prior to entering teaching and since morale has been shown to be a predictor of agricultural education students "plan to teach" (Moss and Briers, 1982).

This research was designed to answer two specific questions:

1. What measures available prior to enrollment and during enrollment in an agricultural education program are statistically significant predictors of whether a student teaches after graduating from the program?

2. Do the statistically significant predictors screen the applicants with sufficient reliability to provide a practical means of selecting students who are likely to enter teaching?

PROCEDURE

This study included the 72 student teachers in the Department of Agricultural and Extension Education at the University of Florida from 1977 to 1982. Before student teaching, each student completed a background data questionnaire, took the Tennessee Self-Concept Scale, and took the Work Values Inventory. Immediately after student teaching, each student took the Purdue Student-Teacher Opinionnaire. Upon graduation from the agricultural education program, each student was contacted to determine whether the student had taken a teaching position during the year following graduation. The data for this study therefore included the demographic characteristics questionnaire, the Tennessee Self-Concept Scale, the Work Values Inventory, the Purdue Student-Teacher Opinionnaire, and the student's post-graduation report to the department as to whether or not (s)he had taken a teaching position.

Demographic Characteristics Questionnaire

The demographic characteristics questionnaire elicited six responses from each student: two continuous variables and four dichotomously scored variables. The two continuous measures were GPA for junior and senior undergraduate work and AGE. The GPA was confirmed by university transcripts. Table 1 reports the means, standard deviations, and ranges for GPA and AGE on the 72 students in this study.

TABLE 1

GPA and AGE of 72 Agricultural Education Students

VARIABLE	$\bar{X}$	SD	MIN	MAX
GPA	2.91	0.53	1.88	3.97
AGE	25.00	5.35	20.00	50.00

The four dichotomously-scored variables were (1) whether the student was male or female (SEX), (2) whether the student had ever enrolled in vocational agriculture in high school (VOCAG), (3) whether the student had belonged to FFA or 4-H for at least one year (CLUB), and (4) whether the student had been raised primarily in a rural or urban area (AREA). For the purposes of this study, male sex, one or more years of enrollment in vocational agriculture in high school, one or more years of club membership, and rural background were scored as ones. The opposite values, female sex, no enrollment in vocational agriculture, no club membership, and urban background were scored as zeros. Table 2 presents the percentages for the dichotomously-scored background variables.

TABLE 2

SEX, VOCAG, CLUB, and AREA of 72
Agricultural Education Students

VARIABLE	PERCENT	PERCENT
SEX	41.67 Female	58.33 Male
VOCAG	44.44 Non Voc. Ag. H.S.	55.56 Voc. Ag. H.S.
CLUB	38.34 Non-Member	61.66 Member
AREA	37.50 Urban	62.50 Rural

From Tables 1 and 2, it can be seen that the average student in this study was 25 years old. Two-thirds of the students had been in FFA or 4-H and had been raised in a rural area. Somewhat more than half had enrolled in vocational agriculture in high schools. There was a fairly even mix of males and females.

Tennessee Self-Concept Scale

The Tennessee Self-Concept Scale is a 100 item multi-dimensional scale which yielded five scores of interest for each of the 72 students: (1) Self-Criticism score (SC), (2) Total Conflict score (TOTC), (3) Total P score (TOTP), (4) Total V score (TOTV), and (5) Distribution score (DIST). The Tennessee Self-Concept Scale Manual (Fitts, 1965) gives the following definitions for the five scores of interest:

1. Self-Criticism Score. This scale is composed of 10 items. These are all mildly derogatory statements that most people admit as being true for them. Individuals who deny most of these statements most often are being defensive and making a deliberate effort to present a favorable picture of themsleves. High scores generally indicate a normal, healthy openness, and capacity for self-criticism (Fitts, 1965, p.2).

2. Total Conflict Score. High scores indicate confusion, contradiction, and general conflict in self-perception. Low scores have the opposite interpretation. The conflict scores are reflections of conflicting responses to positive and negative items within the same area of perception (Fitts, 1965, p.4).

3. Total P Score. It reflects the overall level of self-esteem. Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. People with low scores are doubtful about their own worth, see themselves as undesirable, often feel anxious, depressed, and unhappy, and have little faith or confidence in themselves (Fitts, 1965, p.2).

4. Total V Score. This represents the total amount of variability for the entire record. High scores mean that the person's self concept is so variable from one area to another as to reflect little unity or integration. High scoring persons tend to compartmentalize certain areas of self and view those areas quite apart from the remainder of self. Well integrated people generally score below the mean on these scores but above the first percentile (Fitts, 1965, p.3).

5. Distribution Score. This score is a summary score of the way one distributes his answers across the five available choices in responding to the items on the scale. It is also interpreted as a measure of skill, another aspect of self-perception, certainly about the way one sees himself. High scores indicate that the subject is very definite and certain in what he says about himself while low scores mean just the opposite (Fitts, 1965, p.3).

The data gathered from the 72 students in this study and the normative data collected by Fitts (1965) are reported in Table 3. To determine whether the students in this study had score means higher or lower than the score means from the standardizing population reported by Fitts (1965, pp. 13-14), the means of the study group and the standardized group on the five Tennessee Self-Concept Scale scores reported in Table 3 were compared at the 0.05 alpha level (controlling for error for the family of five comparisons). Four of the means were significantly different: SC, TOTC, TOTP, and TOTV. The students in the study, therefore, tended to have lower self-criticism scores, higher total conflict scores, lower total P scores (self-esteem), and lower total V scores (variability) than the subjects in Fitt's norming population.

TABLE 3

Tennessee Self-Concept Scale Scores on 72 Agricultural Education Students and Normative Data**

SCORE	$\bar{X}$	NORM $\bar{X}$	STUDY SD	NORM SD	MIN	MAX
SC	30.49	35.54*	4.52	6.70	22.00	44.00
TOTC	33.36	30.10*	10.36	8.21	18.00	66.00
TOTP	314.64	345.57*	38.29	30.70	254.00	419.00
TOTV	37.79	48.53*	9.21	12.42	21.00	70.00
DIST	122.64	120.44	20.12	24.19	85.00	174.00

* Study $\bar{X}$ not equal to Norm $\bar{x}$ at the .05 level of significance.

** The normative data reported by Fitts (1965, pp.13-14)is based on a sample of 626 people. Fitts does not describe in adequate detail the sampling procedure or the sample.

Since Fitts (1965) reports no factor-analytic study of the Tennessee Self-Concept Scale scores, the five scores of interest in this study were submitted to a principal component factor analysis with oblique rotation. Oblique rotation was chosen over orthogonal rotation since a clearer factor picture resulted. The two factors with latent roots greater than 1.0 were rotated. Table 4 reports the rotated factor pattern, with factor 1 composed primarily of SC, TOTC, and TOTV and with factor 2 composed primarily of TOTP.

TABLE 4

Rotated Factor Loadings of SC, TOTC, TOTP, TOTV, and DIST Scores from the Tennessee Self-Concept Scale Administered to 72 Agricultural Education Students

VARIABLE	FACTOR 1	FACTOR 2
SC	0.70	0.40
TOTC	0.72	-0.49
TOTP	0.00	0.93
TOTV	0.82	0.12
DIST	0.08	0.53

Since the factor loadings from Table 4 of SC, TOTC, and TOTV on Factor 1 were greater than 0.60, the three scores SC, TOTC, and TOTV were associated with Factor 1. Likewise, since the factor loading of TOTP on Factor 2 was greater than 0.60, the score TOTP was associated with Factor 2. DIST did not load on either Factor 1 or Factor 2.

High scores on Factor 1; therefore, tend to indicate self-criticism, confusion, and variability. Factor 1 is hereafter referred to as UNCERTAINTY. High scores on Factor 2, however, tend to indicate high self-esteem; therefore Factor 2 is hereafter referred to as SELF-ESTEEM. The factor scores UNCERTAINTY and SELF-ESTEEM were the measures from the Tennessee Self-Concept Scale which were used as predictors of whether a student entered teaching after graduation. Table 5 reports the means, standard deviations, and ranges for the factor scores UNCERTAINTY and SELF-ESTEEM. The means and standard deviations for the two factors on Table 5 are zero and 1 respectively because the factor scores were generated as Z-scores (SAS, 1982).

TABLE 5

Tennessee Self-Concept Scale Factor Scores
on 72 Agricultural Education Students**

VARIABLE	$\bar{X}$	SD	MIN	MAX
UNCERTAINTY	0.00	1.00	-1.69	2.58
SELF-ESTEEM	0.00	1.00	-1.91	2.38

** Factor scores were generated with the SAS (1982) SCORE output option in the factor procedure.

Work Values Inventory

The Work Values Inventory is a 45 item scale developed to assess the goals which motivate people to work (Super, 1970). The scale is designed to measure both values extrinsic to as well as those intrinsic to work, that is, the satisfactions people see in work as well as the satisfactions which are the concomitants or outcomes of work. The inventory yields fifteen scales composed of three items for each scale. Table 6 reports the scores on the fifteen scales for the 72 Agricultural Education students in this study and for the normative sample reported in Super (1970). As the asterisks in Table 6 indicate, four of the means for the students in this study and the subjects in the normative sample were significantly different at the 0.05 alpha level (controlling for error for the family of fifteen comparisons). The agricultural education students in this study had significantly higher scores than the subjects in the normative sample on supervisory relations, independence, variety, and altruism. On the other eleven scores, the agricultural education students in this study were not significantly different from the subjects in the normative sample.

TABLE 6

Work Values Inventory Means, Standard Deviation, and Minimum and Maximum Score on 72 Agricultural Education Students and Normative Data**

SCALES	STUDY $\bar{X}$	NORM $\bar{X}$	STUDY SD	NORM SD	MIN	MAX
1. Creativity	11.68	11.09	2.01	2.44	6.00	15.00
2. Management	10.13	9.51	1.94	2.30	5.00	14.00
3. Achievement	13.40	12.75	1.92	2.07	4.00	15.00
4. Surroundings	12.35	12.03	2.30	2.14	6.00	15.00
5. Supervisory Relations	13.51	12.58*	1.85	2.11	6.00	15.00
6. Way of Life	13.82	13.40	1.90	2.01	5.00	15.00
7. Security	11.93	12.60	2.69	2.53	3.00	15.00
8. Associates	10.96	10.92	1.95	2.12	5.00	15.00
9. Esthetics	9.51	8.70	2.30	2.82	4.00	15.00
10. Prestige	11.71	11.27	2.30	2.29	5.00	15.00
11. Independence	12.08	11.35*	1.98	2.20	6.00	15.00
12. Variety	11.68	10.87*	2.06	2.39	6.00	15.00
13. Economic Return	12.43	12.59	2.34	2.24	6.00	15.00
14. Altruism	13.14	12.16*	2.12	2.40	5.00	15.00
15. Intellect Stimulation	11.54	11.64	2.01	2.10	5.00	15.00

* Sample $\bar{X}$ unequal to Norm $\bar{X}$ at the .05 level of significance.

** Normative data from 1,396 students in 12th grade (Super, 1970).

In a factor analytic study of 51 boys and 48 girls in 10th grade, Super (1970) found that the fifteen scales could be reduced to four dimensions: (1) material, (2) goodness of life, (3) self-expression, and (4) behavior control. In order to determine whether the fifteen scales in the current study could be reduced to four similar dimensions, the fifteen scales for each of the 72 agricultural education students in this study were submitted to a principal component analysis with varimax rotation. Varimax rotation was used since it was used in Super's analysis (1970). On the basis of the screen test (Cattel, 1966) and of the fact that only four factors had latent roots greater than 1.0, four factors were rotated. The rotated factor loadings are reported in Table 7.

TABLE 7

Rotated Factor Loadings of Fifteen Scales from the Work Values Inventory Administered to 72 Agricultural Education Students**

SCALES	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
1. Creativity	----	0.77	----	----
2. Management	----	----	0.67	----
3. Achievement	0.82	----	----	----
4. Surroundings	----	----	----	0.52
5. Supervisory Relations	0.71	----	----	----
6. Way of Life	0.73	----	----	----
7. Security	----	----	----	0.58
8. Associates	----	----	0.77	----
9. Esthetics	----	0.70	----	----
10. Prestige	----	----	0.69	----
11. Independence	----	----	----	0.60
12. Variety	----	0.69	----	----
13. Economic Return	----	----	----	0.80
14. Altruism	0.77	----	----	----
15. Intellect Stimulation	----	0.71	----	----

** Factor loadings less than 0.50 have been deleted for clarity.

Scales were considered to be a component of the dimension if the rotated factor loading from Table 6 loaded on the factor greater than 0.60. The four dimensions formed by allocating only scales with factor loadings greater than 0.60 are remarkably similar to the four dimensions produced by the factor analysis of the 10th grade students in Super's study. Table 8 reports the composition of the four dimensions in the present study.

TABLE 8

Work Values Inventory Factors
Formed by Factor Analysis of
72 Agricultural Education
Students

DIMENSION	COMPONENT SCALES
Material	Surroundings, Security, Independence*, Economic Return
Goodness of Life	Achievement, Supervisory Relations*, Way of Life, Altruism
Self-Expression	Creativity, Esthetics, Variety, Intellectual Stimulation*
Behavior Control	Management, Associates*, Prestige

* Super (1970, p.32) reported Independence associated with self-expression, Supervisory Relations associated with Material, Intellectual Stimulation associated with Behavior Control, and Associates associated with Goodness of Life.

For the purposes of this study, therefore, each of the 72 agricultural education students was assigned four Work Values Inventory scores, produced by summing the scale scores associated with the four dimensions reported in Table 8. The means, standard deviations, and ranges for the four dimensions of the Work Values Inventory administered to 72 agricultural education students are presented in Table 9.

TABLE 9

Work Values Inventory Dimension Scores on
72 Agricultural Education Students

DIMENSION	$\bar{X}$	SD	MIN	MAX
Material	48.79	7.27	24.00	59.00
Goodness of Life	53.88	6.78	21.00	60.00
Self-Expression	44.43	6.74	23.00	60.00
Behavior Control	32.79	5.10	19.00	43.00

Purdue Student-Teacher Opinionnaire

The Purdue Student-Teacher Opinionnaire (PS-TO) was administered to each of the 72 agricultural education students in this study immediately after the student's student-teaching term. The PS-TO is a 60 item measure of student-teacher morale, intended to provide educators with objective indices of student-teacher morale. The items in the PS-TO force the student to make qualitative judgments about his or her environment that are believed to be related to morale. The judgments are then quantified into nine scales (Bentley and Price, 1972).

The PS-TO has been widely used in agricultural education research (Briers and Byler, 1979; Byler and Byler, 1981; Moss and Briers, 1982). Although the PS-TO in the present study would not be useful to pre-select agricultural education students into the program because the PS-TO is not normally administered until during or after the student-teaching term, the PS-TO was collected and entered into the analysis since a PS-TO type of measure of morale could in fact be administered prior to entrance into teaching as a screening measure. The medians for the nine scales of the PS-TO on both the students in this study and on the normative sample collected by Bentley and Price (1972) are presented in Table 10.

Table 10 indicates that the students in the study were above the 50 percent norm group in Rapport with Principal, Rapport with University Supervisor, School Facilities and Services, Professional Preparation, and Rapport with other Teachers. Moss and Briers (1982) reported that six of the nine factors were significantly correlated with "plans to teach": Rapport with Supervising Teacher, Rapport with University Supervisor, Teaching as a Profession, School Facilities and Services, Professional Preparation, and Rapport with Students. An exploratory discriminant analysis of the 72 students in the present study indicated that only Teaching as a Profession ($F(1,70)=6.80$, $p<0.01$) was a significant predictor of whether an agricultural education graduate actually took a teaching position after graduation.

TABLE 10

Purdue Student-Teacher Opinionnaire Scale Scores
on 72 Agricultural Education Students
and on Normative Sample**

SCALE	SAMPLE MEDIAN	NORM 25 PERCENT	NORM 50 PERCENT	NORM 75 PERCENT
1. Rapport with Supervising Teacher	3.49	2.77	3.58	3.99
2. Rapport with Principal	3.45	1.73	2.81	3.49
3. Rapport with University Supervisor	3.61	2.39	3.33	3.90
4. Teaching as a Profession	3.14	2.73	3.30	3.83
5. School Facilities and Services	3.54	2.51	3.38	3.92
6. Professional Preparation	3.39	1.78	2.70	3.30
7. Rapport with Students	3.43	3.07	3.63	3.96
8. Rapport with other Teachers	3.53	2.78	3.46	3.92
9. Student Teacher Load	3.38	2.89	3.68	4.00

** The PS-TO was normed on 4,432 student teachers (Bentley and Price, 1970).

RESULTS

In order to distinguish between agricultural education students who were likely to enter teaching in the year after completing the agricultural education program and students who were likely to enter a field other than teaching, a step-wise discriminant analysis was performed. The predicted variable in this analysis was whether or not the student took a teaching position in the year following the completion of the agricultural education program. The predictor variables were the thirteen demographic, academic and test variables for each of the 72 agricultural education students.

As Table 11 reports, the step-wise discriminant analysis indicated that AGE($F(1,70)=5.524$, $p<0.022$) was a statistically significant predictor of the two groups of students. On the second step of the step-wise discriminant analysis, PS-TO was also found to be a significant predictor ($F(1,69)=6.396$, $p<0.014$).

TABLE 11

Results of Discriminant Analysis Between Teaching Group and Non-Teaching Group of 72 Agricultural Education Students

PREDICTOR VARIABLE	TEACH		NOT-TEACH		F	P>F
	$\bar{x}$	SD	$\bar{x}$	SD		
1. GPA	2.91	0.51	2.90	0.58	0.011	0.915
2. AGE	26.21	6.42	23.30	2.58	5.524	0.022
3. SEX	0.41	0.50	0.43	0.50	0.057	0.812
4. VOCAG	0.47	0.50	0.40	0.50	0.402	0.528
5. CLUB	0.60	0.50	0.63	0.50	0.104	0.748
6. AREA	0.36	0.50	0.40	0.50	0.134	0.716
7. UNCERTAINTY	0.07	1.05	-0.11	0.94	0.595	0.443
8. SELF-CRITICISM	-0.09	0.92	0.13	1.11	0.888	0.349
9. MATERIAL	48.91	7.19	48.63	7.50	0.024	0.877
10. GOODNESS OF LIFE	54.56	6.39	53.20	7.34	0.506	0.479
11. SELF-EXPRESSION	45.31	7.00	43.20	6.67	1.731	0.193
12. BEHAVIOR CONTROL	33.12	5.26	32.33	4.92	0.412	0.523
13. PS-TO	30.36	2.80	28.96	3.14	3.966	0.050

The means and standard deviations for the teach and non-teach groups reported in Table 11 indicates that agricultural education students who entered teaching tended to be older (26.21 years) than those students who took other jobs (23.30). The teach group also tended to have higher morale (PS-TO) scores (30.36) than those who did not teach (28.96). The AGE and PS-TO variables were, however, weak predictors of whether or not a student taught, with AGE accounting for only 7.3 percent of the variance in the TEACH variable and PSTO accounts for only 8.5 percent of the variance in TEACH. Consequently, the overall accuracy of the prediction from the standardized discriminant equation when applied to the classification of cases into the two groups was only 53 percent with only 38 of the 72 students correctly classified. The prediction results are reported in Table 12.

TABLE 12

Results of Predicting Group Membership Based Upon the Predictors AGE and PS-TO

ACTUAL GROUP	PREDICTED GROUP		
	NOT-TEACH	TEACH	TOTAL
NOT-TEACH	25 (83%)	5 (17%)	30 (47%)
TEACH	29 (75%)	13 (25%)	42 (53%)

As Table 12 indicates, the standardized discriminant equation has misclassified 29 of the 42 teachers in the study and misclassified five of the thirty non-teachers in the study. Although the standardized discriminant equation predicted relatively well those in the actual non-teaching group (83 percent), the equation misclassified most of the actual teachers in this study (75 percent).

CONCLUSIONS AND RECOMMENDATIONS

This study indicates that of the six demographic and academic variables, of the two measures from the Tennessee Self-Concept Scale, of the four measures from the Work Value Inventory, and of the total score from the Purdue Student-Teacher Opinionnaire, only AGE and PSTO were predictive of whether or not an agricultural education student would enter teaching after graduation. In addition, both AGE and PS-TO were found to be weak predictors, together predicting only 53 percent of the cases correctly. While AGE and PS-TO were statistically more predictive than no predictor, AGE and PS-TO were not effective screening measures of whether a student would enter teaching, since they accounted for such a small amount of the variation in the variable TEACH.

This study therefore suggests that it may be impractical on the basis of demographic, self-concept, work values, and morale measures to pre-screen Agricultural Education students into those likely to teach and those not likely to teach. The current study is, of course, not conclusive, since there may well be variables which might be effective predictors of a student's eventual teaching. It may, however, be that the variables which are most predictive are economic and sociological measures. Although it might be possible by identifying other effective predictor variables to reduce the percentage of students who enter agricultural education programs and who then do not teach, this study suggests that the more fruitful approaches to the agricultural teacher shortage problem might be in the areas of pre-university guidance or teacher morale and satisfaction.

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COMPETENCIES NEEDED TO UTILIZE MICROCOMPUTERS IN VOCATIONAL AGRICULTURE

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INTRODUCTION

The industry of agriculture is rapidly becoming computerized and it is essential that vocational agriculture students become knowledgeable in the use of microcomputers. Thus, vocational agriculture teachers must assume a share of the responsibility of preparing students with the job skills necessary to be an asset to the new and advancing technology.

As a first step in assuring that vocational agriculture teachers possess the necessary knowledge and skill to use microcomputers in vocational agriculture in a proficient manner, it is important to identify the specific competencies they will need. Considerable research has been done to identify the pedagogical competencies which teachers should use in vocational agriculture programs. However, little if any information clearly related to teacher competencies in using microcomputers is available. Many teachers develop competencies through trial and error methods. This latter route has a way of becoming circular as teachers identify needs related to what they have learned, need to teach, want to teach, or are teaching. Their perceptions of the pedagogical competencies to use may or may not be related to the ones that should be used. It is this lack of clear identification of the microcomputer competencies needed by teachers of vocational agriculture that provided the motivation and the direction for this study.

If teacher educators are to provide guidance for the use of microcomputers in the classroom, their recommendations must be based on more than one person's knowledge. As demands are placed on teacher training institutions to provide courses to prepare present and prospective teachers in the correct use of microcomputers, teacher educators must develop such courses. Vocational agriculture teachers must do likewise as school administrators, parents, and students approach them with questions and problems concerning microcomputers. This study should assist teacher educators, administrators, and teachers in advancing the level of instruction through the use of microcomputer technology.

The research in this study was an effort to provide additional information needed to update vocational agriculture programs in the area of teacher competencies in microcomputers. Specifically, the study attempted to provide information useful for (a) planning preservice instruction for prospective teachers of vocational agriculture, (b) planning inservice teacher education courses for vocational agriculture teachers, and (c) planning local vocational agriculture programs for secondary students and adults.

OBJECTIVE

The objective of the study was to identify and evaluate teacher competencies needed to utilize microcomputers in vocational agriculture.

METHODS AND PROCEDURES

The following methods and procedures were used in conducting the study:

1. A review of the literature was conducted to determine the state-of-the-art of teacher competencies in microcomputers.

2. The Delphi technique was selected as a means of identifying and evaluating the teacher competencies.

3. Heads of agricultural education departments throughout the United States were used to identify educators who were both familiar with vocational agriculture and who were considered to have microcomputer expertise.

4. A panel of 35 experts was selected to identify and evaluate the competencies.

5. Four iterations of the Delphi technique were used to identify and attain a consensus on the importance of the teacher competencies.

6. Inductive analysis was used to allow four categories to emerge from the array of competencies identified by the experts.

7. The panel of experts evaluated the importance of the competencies through a five point Likert-type scale.

8. Responses to the evaluation of the competencies were averaged to determine the level of importance of each competency prior to each subsequent questionnaire.

9. On two separate occasions the respondents were allowed to reconsider their responses in view of the ratings given to each competency by all of the experts.

10. On the last iteration the panel was provided with a list of minority opinions to assist in reconsidering their previous responses. The minority opinions were provided by the panel members if their response was not the same as the most frequent response of the group.

11. Recommendations were made as to which competencies should be developed by teachers in using microcomputers in vocational agriculture programs.

RESULTS

Findings

The items in this section provide a summary of the findings of the study.

1. There were 51 teacher competencies (Table 1) identified as being appropriate to the use of microcomputers in vocational agriculture.

2. A total of 48 of the teacher competencies identified were evaluated as having importance to utilizing microcomputers in vocational agriculture programs. Only three competencies were considered not important to vocational agriculture programs.

3. Of the 51 competencies identified, the modal response was "3" (medium importance) or higher on 46 of the competency statements. Only two competencies were rated as having low importance to teachers in utilizing microcomputers in vocational agriculture programs.

Conclusions

The findings of this study justify the following conclusions:

1. The 48 competencies identified and evaluated as having some level of importance are the teacher competencies needed to utilize microcomputers in vocational agriculture programs.

2. The importance of the identified teacher competencies to vocational agriculture programs is shown by the final modal rating of each competency.

Recommendations

The following recommendations were made as a result of this study:

1. The use of the teacher competencies identified in this study should be governed by the relative importance placed on them by the panel of experts.

2. Those competencies which attained a final modal rating of "3" (medium importance) and higher should be given serious consideration for use in the following:

   a) Planning preservice instruction for prospective teachers of vocational agriculture.

   b) Planning inservice teacher education courses for vocational agriculture teachers.

   c) Planning local vocational agriculture programs for secondary students and adults.

TABLE 1

Final Ratings of Teacher Competencies

Competencies	% Responses Delphi IV				
	5	4	3	2	1[1]
Category A. General Competencies					
1. Describe the historical development of microcomputer technology.	00	04	11	82	04
2. Define microcomputer terminology.	18	75	07	00	00
3. Calculate the costs of microcomputer ownership.	11	18	68	04	00
4. Identify the educational goals for using microcomputers.	96	04	00	00	00
5. Demonstrate a positive, nonfearful attitude toward microcomputers.	100	00	00	00	00
6. Use an operator's manual.	82	11	07	00	00
7. Describe the use of microcomputers in the agricultural industry.	93	04	00	04	00
8. Perform maintenance on microcomputers.	04	00	71	18	07
9. Advise patrons on microcomputer selection.	00	61	32	07	00
10. Advise patrons on microcomputer use.	86	07	04	00	04
11. Locate a program using a catalog or diskette directory.	93	07	00	00	00
12. Identify the interfacing opportunities in the community, i. e., campus, extension service, banks, etc.	18	75	04	04	00

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[1] Rating Scale: 5= extremely high importance, 4= high importance, 3= medium importance, 2= low importance, and 1= no importance.

TABLE 1 (continued)

Competencies	% Responses Delphi IV				
	5	4	3	2	1[1]
Category B. Programming Competencies					
1. Describe programming logic.	04	11	75	04	07
2. Develop a flowchart.	11	11	68	04	07
3. Develop a program using BASIC language.	18	07	64	00	11
4. Program in a language other than BASIC.	04	04	04	21	68
5. Describe the use of control statements.	71	14	07	00	07
6. Design assignments which require progressively greater programming skills.	07	51	14	21	07
7. Program mathematical functions.	07	11	71	04	07
8. Demonstrate debugging a program.	71	04	10	07	07
9. Design a series of microcomputer applications that are relevant to the course of study.	86	04	07	04	00
10. Translate programs from one language to another.	00	00	04	14	82
11. Link programs together.	00	04	14	71	11
12. Evaluate individually developed programs.	89	07	04	00	00

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[1] Rating Scale: 5= extremely high importance, 4= high importance, 3= medium importance, 2= low importance, and 1= no importance.

TABLE 1 (continued)

Competencies	% Responses Delphi IV				
	5	4	3	2	1[1]
Category C. Hardware Competencies					
1. Describe the differences among brands and models of microcomputers.	00	18	79	00	04
2. Demonstrate the operation of microcomputers.	100	00	00	00	00
3. Describe the limitations of microcomputers.	25	75	00	00	00
4. Use the keyboard.	100	00	00	00	00
5. Use the cassette recorder.	04	04	00	14	79
6. Use the disk drive.	100	00	00	00	00
7. Use the printer.	93	00	07	00	00
8. Use the graphics tablet.	04	00	79	11	07
9. Communicate with other computers/networks.	11	18	71	00	00
10. Describe the operation of the components of the microcomputer, i. e., CPU, memory chips, etc.	00	04	82	14	00
11. Select microcomputers for specific uses.	18	07	75	00	00
12. Restore the system to operation after detecting an error message.	89	11	00	00	00
13. Arrange microcomputers in the classroom.	11	68	18	00	04
14. Evaluate microcomputers.	25	57	14	04	00

---

[1] Rating Scale: 5= extremely high importance, 4= high importance, 3= medium importance, 2= low importance, and 1= no importance.

TABLE 1 (continued)

Competencies	% Responses Delphi IV 5	4	3	2	1[1]
Category D. Software Competencies					
1. Identify software useful for instruction in agriculture.	96	04	00	00	00
2. Evaluate software for instructional purposes.	96	04	00	00	00
3. Use different types of instructional software,i.e., simulation, drill and practice, etc.	89	04	07	00	00
4. Identify software useful for agricultural industry/home applications.	93	07	00	00	00
5. Evaluate software developed for agricultural industry/home applications.	96	04	00	00	00
6. Use software developed for agricultural industry/home applications.	93	07	00	00	00
7. Describe where software fits into the teaching calendar.	75	11	11	00	04
8. Identify modifications needed in software.	71	18	11	00	00
9. Evaluate student output from software.	93	07	00	00	00
10. Use software to maintain student records.	11	86	04	00	00
11. Use computer assisted instructional programs.	14	64	21	00	00
12. Use the microcomputer as a word processor.	18	29	54	00	00
13. Organize a microcomputer software library.	14	86	00	00	00

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[1] Rating Scale: 5= extremely high importance, 4= high importance, 3= medium importance, 2= low importance, and 1= no importance.

3. Future research should be conducted to determine the perceptions of vocational agriculture teachers and clientele as to the relative importance of the identified teacher competencies.

4. Future research should be conducted to determine the extent to which telecommunication can be used to shorten the time it takes to conduct a Delphi study.

5. Due to the rapid advancement of microcomputer technology, this study should be replicated periodically.

6. Replication of this study should be conducted in the agricultural extension component of agricultural education.

7. In future studies using the Delphi technique, where it is eminent that categories will have to be established, consideration should be given to allowing categories to develop naturally.

Discussion

In future research on teacher competencies, a more detailed description should be included with each competency statement than was included in this study. This description should include two or three sentences which define the exact boundaries of each competency. These boundaries are especially essential where there is a possibility for misunderstanding. In this study it is possible that the lack of a clear understanding of a few of the competency statements under the programming category caused a higher rating than was expected. Future research will determine if the ratings were affected in this manner.

The Delphi technique does not have to reach consensus. However, consensus was reached on all of the competencies in this study. This is a strong factor in recommending that the Delphi technique continue to be used to develop new curriculum areas.

Future research on teacher competencies in microcomputers should include a higher percentage of the practitioners being studied. Due to the small number of vocational agriculture teachers recommended as having expertise in microcomputers, a low percentage of teachers were selected to participate in this study. However, as vocational agriculture teachers obtain expertise in microcomputers, a larger percentage will be available for use as microcomputer experts.

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THEME: A LOOK AT INSTRUCTIONAL MATERIALS

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PAPERS REVIEWED
Evaluation of an Agriculture/Agribusiness
Management Instructional Unit
Robert J. Birkenholz and Alan A. Kahler

Experimental Evaluation of an Instructional Packet
on Supervised Occupational Experience Placement Programs
for Vocational Agriculture
John W. Slocombe and David L. Williams

An Assessment of Attitudes, Needs, and Delivery System
for Microcomputer Applications by Agricultural
and Extension Educators in Mississippi
M. Joy Cantrell and Ben L. Byler

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GENERAL COMMENTS

It would seem appropriate to begin such a discussion with words of praise for people who are seeking answers to important problems related to our profession. As our knowledge base grows and as efforts continue to seek clarity in understanding important problems, the profession will be vital and able to change with the times as is appropriate.

No one knows more about what went on in these research efforts than the researchers. Therefore, my remarks will be given more in the form of questions which occurred to me as I read and studied their papers. I am not fully aware of the constraints that existed at the time or location of these studies. In addition, I am reacting to a very brief presentation of their experience and as such may ask questions for which there are perfectly logical answers.

COMMENTS OF THE FIRST TWO STUDIES REPORTED IN THIS SESSION

The first two studies are somewhat similar. They are evaluation studies of particular curriculum materials. Both studies were experimental in nature. It is good to see these kinds of efforts being done in Agricultural Education. We are often criticized as a profession for not doing this kind of research.

As I began to think about these types of studies, it seemed appropriate to consider what people who work in evaluation of curriculum materials identify as important to take into account. Basically four areas are considered by educators generally when doing curriculum materials evaluation. Those are a) Utility, b) Feasibility, c) Propriety, and d) Accuracy. These two studies really only addressed item d. Why? Can there be other reasons to consider using materials besides testing?

BIRKENHOLZ AND KAHLER STUDY

This was an interesting study. Appropriate and sophisticated statistical techniques were employed. This was a positive effort but points to some difficulties which may be faced when trying to do experimental research in education, particularly when faced with some fairly long periods of time. Following are some questions that came to my mind as I reviewed this paper:

1. A number of relationships were looked at in the study. Why were these particular relationships studied?

2. The study reported 282 vo-ag teachers in Iowa. Seventy-two were selected to participate in the study. Thirty-six were randomly assigned to the experimental group and 36 were randomly assigned to the control group. Twenty-six of those in the experimental group responded and 22 in the control group responded. Of those responding, 16 in the experimental group and 12 in the control group provided usable information. What was done about non-reponse bias? Was the threat of differential mortality considered?

3. It would appear that the researchers have some basis for believing that the materials being used may present some positive results. Why was there no inservice training provided in the use of the materials?

4. The control group was given what would appear to be a rather significant portion of the experimental treatment. Why was this done?

5. What about pretest effects?

6. What really occurred in the classrooms? Were the materials really used as intended? How do you know?

7. Is the difference which was significant, practical? Is it really worth the effort?

8. The recommendations appear to be rather broad. Is it possible to offer more specifiec recommendations?

SLOCOMBE AND WILLIAMS STUDY

As already indicated, this study was similar to the study just discussed. As such, several of these comments will be redundant. However, in an effort to be as clear as possible, I will repeat where necessary. This particular study is a continuation of a long standing commitment of David Williams and those with whom he works to learn more about supervised occupational experience programs. Truly he is the "expert" in this field. I pay my regards for his efforts to do programatic research and compliment those who have seen fit to study with him for this whole area is of major concern to all of us in agricultural education.

As I reviewed this study by Slocombe and Williams, several questions came to mind that I would like to pose here:

1. This study also had a fairly high rate of non-response. What was done to check for non-response bias? Why was such a high rate of non-response found in this study?

2. As in the other study, persons in the control group were given a fairly significant portion of the experimental treatment. Why was this done? Could other means have been found to keep the experimental treatment more discreet?

3. How was the treatment actually administered and how can we be sure it occurred as it was intended?

4. Why was no inservice provided?

5. There is almost no support for the recommendations and they really do not seem to flow from the study. Why?

6. There were no significant differences in the results from the experimental and control group. Does this mean that the efforts in the development of these instructional materials has been wasted? I would refer back to some of my early remarks about a larger context.

CANTRELL AND BYLER STUDY

This particular study was significantly different from the other two studies already discussed. It was a descriptive study which made an attempt to assess pertinent concerns regarding the use and adoption of the microcomputer technology. Obviously, this is an important area of concern and I commend the researchers for beginning efforts to do something about an area which we all must become concerned.

As in the other studies, several questions occurred to me as I studied the paper which has been presented. Following are those questions:

1. In the pilot test professionals were used. It is not clear to me who those professionals were. Who were they?

2. Proportional stratified random sampling was used in this study. Such an effort must be taken into account when generalizing. Why was this type of sampling used instead of random sampling?

3. Great care was taken to check the reliability of the instruments used in this study. What was done to check for the face and content validity?

4. It would appear appropriate in a study such as this to report some of the findings in frequency distributions. Why wasn't this done?

5. What was done to determine the effect of non-response bias?

6. At times some of the data are reported for the entire group of respondents and other times they are reported for each of the groups involved. Why the different treatment of the data?

7. There appear to be some commonalities of the groups in this study and there are some obvious differences. Are the commonalities strong enough to warrant the grouping of these different professional subjects as was done?

8. You propose that teacher education programs should do more by the way of inservice and preservice related to computers. What will happen if this does not occur? Are there others who might more appropriately provide such instruction?

CONCLUSION

Let me re-emphasize the fact that my goal was not to be overly critical of the research which has been reported here. Frankly, more good can be said of those and the work they do who at least attempt to find answers to troublesome questions. I applaud you researchers who, with greater resources and more time would perhaps choose to follow other more refined paths to get answers to those quesitons. However, you made the effort and did a good job without those resources and extra time. You are an example to each of us who one way or another struggles to get answers for the questions we perceive as important.

EVALUATION OF AN AGRICULTURE/AGRIBUSINESS MANAGEMENT INSTRUCTIONAL UNIT

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INTRODUCTION

Instructional materials have been used in classrooms since the beginning of formal education. Examples of instructional aids used in the past include The Bible, a slate and McGuffy's Reader. Today, instruction is enhanced through the use of movie films, video tapes, television, computers and a variety of printed materials.

Vocational agriculture instructors have tended to rely heavily on instructional aids due to the technical nature of the subject matter with which they deal. Materials used in vocational agriculture classes have often been adopted for use without first determining their educational value.

Vocational agriculture programs in secondary schools have been faced with expanded curricula as a result of the Vocational Education Act of 1963. Mandated expansion of vocational agriculture curricula has left instructors grasping for quality instructional materials in an era of rapid technological change (Geesey, 1976).

Teachers of vocational agriculture have become dependent on instructional materials to aid them in teaching subject matter outside their areas of expertise; and to provide learning experiences in a more interesting or efficient manner than may otherwise have been possible. These teachers must be able to identify and select materials for use in their classes which are capable of producing desired learning outcomes in students.

Evaluation of instructional materials used in vocational agriculture classes is important and must not be overlooked. Individual instructors have been unable to assess the quality and value of available instructional materials due to a variety of constraints; mainly time and money. Therefore, the responsibility for determining the quality and value of such materials must be fulfilled by other persons involved in the curriculum development process.

Previous research has indicated that evaluations of this nature should consider the effect of using newly-developed instructional materials on the "teaching-learning" process (Ridenour, 1965). Many researchers (i.e., Ridenour and Woodin, 1966; Kaas, 1976; et. al.) have noted that the focus of instructional material evaluations should center on student achievement. Gliem (1976) expanded the criteria for such evaluations to include changes in student attitudes and abilities as well as student achievement.

The central problem of concern for this investigation was to determine the effectiveness of an instructional unit in Agriculture/Agribusiness Management when used in selected Iowa vocational agriculture classes. Evaluative criteria included changes in student achievement and attitudes, as well as instructor perceptions of the quality and value of the unit. Psychomotor skills and abilities had only limited applicability to the relevant subject matter area and were not directly evaluated.

OBJECTIVES

The purpose of this research was to experimentally test the effectiveness of an instructional unit in Agriculture/Agribusiness Management. Specific objectives were identified as follows:

1. to determine the effectiveness of the instructional unit as evaluated by changes in:
   a. student knowledge of Agriculture/Agribusiness Management.
   b. student attitudes toward Agriculture/Agribusiness Management.
2. to determine the effectiveness of the instructional unit in relation to traditional materials.
3. to identify relationships which may exist between students' personal or school situational characteristics and achievement in or attitude toward the subject matter area.
4. to identify relationships which may exist between instructors' personal or school situational characteristics and student achievement in or attitude toward the subject matter area.
5. to determine teacher perceptions regarding the quality and value of the instructional unit.

Each of the objectives identified above were deemed to be contributing factors regarding the overall effectiveness of the instructional unit evaluated. By collectively interpreting the data gathered to fulfill each objective the researcher was then able to assess the overall effectiveness of the instructional unit.

METHODS AND PROCEDURE

This investigation was directed toward evaluation of an Agriculture/Agribusiness Management instructional unit developed by the researcher. Materials included in the unit were collected, adapted, developed and arranged in ten problem areas. Agriculture/Agribusiness Management was selected as an appropriate title which provided a general indication of the content (Rawlins, 1980). Specific problem areas included were selected from those identified in the Farm Business Management section of the Iowa Curriculum Guide in Agribusiness and Natural Resources Education (1973).

Materials in the unit were assembled in a format conducive to problem-solving teaching similar to that suggested by Lancelot (1929).

Each problem area was characterized by the following components: problem area question, situational statement, study questions, references and instructional materials, learner needs, suggested interest approach, learning activities, conclusion, evaluation critieria and optional learning activities.

The instructional unit was intended to aid teachers in guiding the learning experiences of their students. Learning activities included in the unit emphasized student experiences to enhance the learning process.

A pretest-posttest, control group design (Campbell and Stanley,(1971) was selected as the research model used for this investigation. Seventy-two vocational agriculture teachers were selected from a list of 282 instructors employed in Iowa high schools during the 1981-82 school term. Teachers selected were those who the researcher felt would most likely participate in the study by fulfilling all responsibilities assigned. This criterion was necessary to insure that participating instructors would teach the unit as directed by the researcher.

Equal numbers of teachers (i.e., 36) were randomly assigned to either an experimental or control treatment group. Selected teachers were listed in alphabetical order by last name, numbered chronologically and the first 36 identified using a table of random numbers were designated as the experimental treatment group. Remaining teachers were then designated as the control group.

Hinkle, Wiersma and Jurs (1979) supported the usefulness of samples selected in such a manner when they wrote:

> "Non-random samples can be used in research. If assignment to treatments is random, inferences based on statistical results can be made to the individuals included. Such inferences may be extended to other populations, but only on a logical, not on a statistical basis."

Selected teachers were contacted by letter, asked to obtain their building principal's permission and return a self-addressed postcard to the researcher acknowledging their willingness to participate in the study. Twenty-six experimental and 22 control group instructors returned cards indicating their intention to participate as requested. Most teachers who declined to participate indicated they were unwilling or unable to teach the unit within a three-month time constraint imposed by the researcher.

Experimental treatment group instructors were asked to teach the subject matter exactly as suggested in the unit which they were provided. Control group instructors were provided the list of Problem Area Questions and Study Questions contained in the unit and asked to focus their instruction on those components using materials currently available. Neither instructor group was provided inservice training regarding the subject matter or use of the materials prior to or during the experiment.

Several data collection instruments were developed and used as a part of this investigation. Student achievement levels were ascertained via pretest and posttest administration of a forty item multiple choice examination labeled: Knowledge Inventory. Individual items on the examination focused on the Problem Area Questions and Study Questions which were provided to instructors in both treatment groups.

Each item on the Knowledge Inventory was randomly arranged on the pretest form and randomly re-arranged on the posttest form. Individual items were identical on both forms to maintain the level of difficulty.

Pretest reliability was estimated to be .80 and the posttest estimate increased to .83 when computed as part of the experiment using the formula for a Kuder-Richardson 20 reliability coefficient.

Indications of student attitudes toward Agriculture/Agribusiness Management were collected through development and administration of a student Attitude Inventory. Six concepts related to Agriculture/Agribusiness Management were evaluated by students. A semantic differential technique was employed asking students to respond to each concept using a seven-point scale with one member of a bipolar adjective pair at each extreme. Bipolar adjectives were exact opposites in meaning and respondents were directed to place a check mark (X) in one of seven positions between the bipolar adjectives relative to each students' feelings toward the concept presented (McMillion & Phipps, 1967).

Students were asked to respond to six pairs of bipolar adjectives for each of the concepts presented. More positive adjectives were positioned on the right-hand side of the scale to reduce respondent confusion. Responses were coded from one to seven by the researcher after collecting the Attitude Inventory instruments from students. One subscale for the concept "MAKING DECISIONS" is illustrated below:

MAKING DECISIONS

Unimportant:____:____:____:____:____:____:____:Important

After numerically coding student responses, a mean student response score was computed for each concept. Due to high interitem correlations, data analysis was conducted using these concept means rather than individual subscale responses. Attitude Inventory instruments were not altered from pretest to posttest.

Reliability estimates were computed for the overall Attitude Inventory as well as each individual concept. Cronbach alpha reliability coefficients were computed using the SPSS subprogram RELIABILITY (Nie, et. al., 1975). Overall Attitude Inventory reliability was estimated to be .905 for the pretest administration and .944 for the posttest. Individual concept reliabilities ranged from .733 to .935 and each was found to increase from pretest to posttest.

Students were asked to provide information concerning their personal characteristics and previous experiences. A Student Data Instrument was prepared by the researcher to facilitate collection of the desired information.

Participating instructors were also asked to supply information regarding their educational background and school situation. Teachers were asked to provide the needed information on a Teacher Data Instrument developed and provided by the researcher.

Experimental group instructors were also asked to evaluate the Agriculture/Agribusiness Management instructional unit provided them using two measures. First, an eleven-subscale semantic differential format was used to enable teachers to indicate their feelings toward the quality of the unit in general terms. The Cronbach alpha reliability estimate for this instrument was .82.

The second method used to evaluate the instructional unit employed a nine-point Likert scale to determine the "value" of specific components and aspects of the unit. A scale value of "1" was used to indicate a specific component was of "no value", "5" was used for a response of "some value" and "9" for the "utmost value". Respondents were encouraged to use any number from one to nine to indicate their perception of the value of each component.

Student Knowledge Inventory responses were recorded on IBM General Purpose Answer Sheets and machine scored by ISU Computation Center personnel. All data collection instruments were coded with a two-digit 'respondent number' and a three-digit 'instructor number' to match each students' pretest and posttest data and correlate them with their respective instructor. Data were punched onto 80-column IBM computer cards by ISU Computation Center personnel. Only the total number of correct responses on the student Knowledge Inventory was entered on each student's record.

Teacher data were also punched onto 80-column IBM cards, although physically separated from student records. Pretest and posttest class means for the Knowledge Inventory were entered on teachers' record for their respective classes. Attitude Inventory class means were computed for each of the 36 subscales and entered onto each respective teachers' record because of the impropriety of computing a single overall class attitude mean. Teacher and student records were not co-mingled thoughout the data analysis procedure.

Student knowledge and attitude measures were collected immediately prior to and following instruction in the subject matter area. Student and instructor personal data and experimental group instructor evaluations of the instructional unit were collected during administration of the posttest.

Data analysis procedures focused on fulfilling the objectives identified for this investigation. Findings and conclusions resulting from this study were necessarily limited to participants. Generalizations and resulting implications may only be extended to other groups on a logical, not a statistical basis.

RESULTS

Twenty-eight of the 48 Iowa vocational agriculture teachers who initially agreed to participate in this study provided usable data for analysis. Instructors who did not provide complete and usable data most often cited problems caused by adverse winter weather conditions as their reason for non-participation.

Usable data were collected from 16 classes and instructors assigned to the experimental treatment group and 12 classes and instructors representing the control treatment group. Class means were computed using data provided by students as classes were identified as the experimental unit rather than individual students. Data analysis therefore focused on class means and not individual student responses.

The SPSS T-test procedure was employed to identify differences which existed between treatment groups for selected student characteristics. Results of these tests revealed that random assignment of instructors (i.e. classes) to treatment groups was successful as class mean differences were not found to be significant ($p > .05$). From this finding the researcher concluded that comparisons could be made between the two treatment groups.

Instructor characteristics were also examined for differences which may have existed using the T-test procedure. Again, significant differences were not revealed ($p > .05$) leading the researcher to conclude that comparisons between treatments groups could be made.

Instructional effectiveness was evaluated by comparing pretest and posttest Knowledge Inventory class means for each treatment group, respectively. Data in Table 1 reveal results of paired T-tests for Knowledge Inventory class means from both treatment groups. Each treatment group produced significantly higher ($p < .05$) posttest knowledge means than their respective pretest means.

Table 1. PRE-POSTTEST KNOWLEDGE SCORE MEAN DIFFERENCES.

Time of Administration	N	$\overline{X}$	S.D.	T-Value	Prob.
Control Group (D.F. = 11)					
Pretest	12	21.31	3.93	-2.95	0.013
Posttest	12	24.51	5.02		
Experimental Group (D.F. = 15)					
Pretest	16	22.63	3.09	-7.33	0.000
Posttest	16	28.56	1.94		

Changes in student attitudes were evaluated by comparing pretest and posttest Attitude Inventory class means of each treatment group, respectively. Only the control group produced significantly different ($p=.017$) class means for the 'corporate farming' concept. No other concept class mean changed significantly from pretest to posttest for either treatment group, although response means tended to be more positive on the posttest.

Comparisons of both Knowledge and Attitude Inventory treatment group means enabled the researcher to evaluate the effectiveness of the instructional approach suggested by the unit with 'traditional' instructional materials. Covariate analysis was employed to equalize classes on pretest measures, thereby allowing the researcher to identify the posttest variance attributable to the experimental treatment effect after accounting for pretest differences.

Table 2 presents results of the analysis of covariance test using pretest class means as the covariate variable. Significant F-statistics were computed for both pretest and experimental treatment effects. This finding revealed that both pretest and experimental treatment variables accounted for a significant portion of the variance associated with posttest knowledge means. More specifically, after equalizing treatment groups for pretest differences, experimental group classes scored significantly higher ($p=.011$) on the posttest Knowledge Inventory than did the control group.

Posttest Attitude Inventory class means were compared in a similar fashion and revealed no significant ($p > .05$) treatment effect. However, using pretest attitude class means as the covariate variable resulted in a significant F-statistic ($p=0.000$). This finding indicated that pretest Attitude Inventory class means accounted for a significant portion of the variance associated with posttest Attitude Inventory.

Table 2. PRESTEST KNOWLEDGE SCORE COVARIATE ANALYSIS OF AGRICULTURE/AGRIBUSINESS MANAGEMENT KNOWLEDGE SCORES.

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-value	Prob.
Covariate (Pretest Knowledge Score)	1	127.28	127.28	13.02	0.001
Main Effect (Treatment)	1	73.54	73.54	7.52	0.011
Error	25	244.47	9.78		
Total	27	445.28	16.49		

Several student characteristics were examined to determine their influence on posttest knowledge and attitude scores. Measures of relationship were estimated using student data rather than class means as the intent was to identify significant relationships on an individual student basis.

A stepwise regression procedures was employed to identify characteristics which exhibited a significant influence on posttest knowledge scores. Categorical variables were introduced into the regression analysis as 'dummy variables'. Four student characteristics entered the regression equation which accounted for 56.14 percent of the variance associated with posttest knowledge scores as shown in Table 3.

Multiple regression analysis was also employed to identify student characteristics which were able to explain a significant portion of the variance associated with posttest Attitude Inventory scores. Three variables entered the regression equation as significant ($p < .05$) predictors of posttest attitude scores and accounted for nearly 45 percent of its variance. Results of this analysis are presented in Table 4.

Teachers were also asked to provide information about their background and teaching situation which may have influenced student responses. Posttest class means were used as the basis upon which measures of relationship were computed. Regression analysis was again employed to identify teacher variables which accounted for a significant portion of the variance associated with posttest Knowledge and Attitude Inventory class means. Table 5 presents results of this procedure for posttest Knowledge Inventory class means. It was revealed that the number of class periods allocated to instruction in the subject matter area was not significantly related (r=.05) to posttest knowledge class means. Therefore, student achievement appeared to be more a function of instructional quality rather than quantity.

Table 3. STEPWISE REGRESSION ANALYSIS OF STUDENT CHARACTERISTICS ON POSTTEST KNOWLEDGE SCORES.

Step	Variable Entered	B[a]	Multiple R	F-value[b]
1	Letter Grades Received[c]	-3.46	0.581	133.78
2	Pretest Knowledge Score	0.35	0.673	55.25
3	Experimental Treatment (Dummy Variable)	3.58	0.734	48.32
4	Plan to Work in an Agribusiness after H.S. Graduation (Dummy Variable)	-4.19	0.749	13.83
	Constant = 25.03	Multiple R-square = 0.5614		

[a] Regression coefficients for the final prediction equation.

[b] F, 1, 260, .o-5 = 3.84

[c] Responses were coded: Mostly A's = 1, Mostly B's = 2,
Mostly C's = 3, Mostly D's = 4.

Table 4. STEPWISE REGRESSION ANALYSIS OF STUDENT CHARACTERISTICS ON POSTTEST ATTITUDE SCORES.

Step	Variable Entered	B[a]	Multiple R	F-value[b]
1	Pretest Attitude Score	0.73	0.643	190.69
2	Semesters of Science	-0.58	0.656	7.71
3	Years in FFA	0.78	0.667	6.90
	Constant = 1.50	Multiple R-square = 0.4446		

[a] Regression coefficients for the final prediction equation.

[b] F, 1, 268, .05 = 3.84

Table 5. STEPWISE REGRESSION ANALYSIS OF INSTRUCTION CHARACTERISTICS OF POSTTEST ATTITUDE CLASS MEANS.

Step	Variable Entered	B[a]	Multiple R	F-value[b]
1	Experimental Treatment (Dummy Variable)	3.58	0.468	7.01
2	Months of Prior Agribusiness Experience	-0.16	0.639	7.71
3	Number of Vo. Ag. Classes Taught Per Day	-1.98	0.714	4.77
	Constant = 35.12	Multiple R-square = 0.5104		

[a] Regression coefficients for the final prediction equation.

[b] F, 1, 25, .05 = 4.26

High school enrollment was the only teacher variable found to explain a significant (p=0.024) portion of the variance associated with posttest Attitude Inventory class means. However, this variable was able to explain only 20.10 percent of posttest attitude variance. Attitude class means were found to be more positive from schools with larger student populations.

Experimental group instructors were asked to provide information regarding the quality and value of the instructional unit provided them. Means, standard deviations and response ranges for each of the characteristics identified are presented in Table 6. Seven of the ten characteristics examined produced mean scores higher than 5.00 which the researcher considered a 'positive response'. The three remaining characteristic means were computed in the 'neutral response' category (i.e. 3.00-5.00) and no characteristic means were computed in the 'negative response' category (1.00-3.00).

Individual components of the instructional unit were evaluated by experimental group instructors who were asked to respond to the "value" of each on a nine-point Likert scale. Means, standard deviations and response ranges for each component are presented in Table 7.

For ease of interpretation, the response scale was divided into three regions (i.e. < 3.67-least value; 3.67 to 6.33-average value; and > 6.33-greatest value). Means were computed in the greatest value category for five components and three questions regarding the usefulness of the instructional unit. All remaining component means were computed in the average value category.

Table 6. EVALUATION OF INSTRUCTIONAL UNIT CHARACTERISTICS BY EXPERIMENTAL GROUP INSTRUCTORS.

Characteristic	$\overline{X}$	S.D.	Response Range[a]
	N = 16		
Effectiveness[b]	5.19	0.83	3.00 - 6.00
Usefulness	5.38	0.96	3.00 - 7.00
Appropriateness	5.38	1.03	3.00 - 7.00
Accuracy	5.81	0.83	4.00 - 7.00
Simplicity	4.50	1.37	1.00 - 6.00
Readability	5.44	1.09	2.00 - 7.00
Visual Appeal	4.75	1.44	2.00 - 7.00
Need	5.44	1.03	4.00 - 7.00
Worth	5.56	0.73	4.00 - 7.00
Completeness	4.63	1.26	2.00 - 7.00

[a] Range of scale values provided by experimental group instructors.

[b] Characteristics identified were considered to be the more positive adjective of each bipolar pair.

CONCLUSIONS

Both experimental and control group classes produced significantly higher posttest Knowledge Inventory means than pretest means. This finding led the researcher to conclude that instruction provided in both treatment groups was effective in increasing student understanding of the subject matter. Student achievement, estimated by pre-posttest differences, was assumed to have resulted from instructors' efforts to increase the knowledge level of their students. Teaching style, methodology and interpersonal factors influencing instructional effectiveness were assumed to have varied in a random fashion among treatment groups.

Student attitudes did not appear to change appreciably during the course of this investigation. The general trend was toward more positive responses from pretest to posttest, although the shift was not found to be statistically significant. The researcher therefore concluded there was insufficient time or opportunity to significantly alter student attitudes toward the concepts presented. Also, instruments used to 'measure' student attitude changes may have lacked the precision necessary to identify such changes.

Table 7. VALUE OF INSTRUCTIONAL UNIT COMPONENTS AS PERCEIVED BY EXPERIMENTAL GROUP INSTRUCTORS.

Component	$\overline{X}$[a]	S.D.	Response Range[b]
	N = 16		
Problem Area	6.38	1.09	5.00 - 8.00
Study Questions	6.56	1.03	5.00 - 8.00
Learner Needs	5.75	1.65	1.00 - 7.00
Interest Approach	6.88	1.41	3.00 - 8.00
Learning Activities	7.00	0.97	5.00 - 8.00
Conclusions	6.81	1.22	5.00 - 9.00
Evaluation Criteria	6.19	1.38	3.00 - 8.00
Optional Learning Activities	5.88	1.59	2.00 - 8.00
Reducing Preparation Time	7.69	1.20	5.00 - 9.00
Developing Units in Other Areas	7.44	1.09	5.00 - 9.00
Distributing Unit to Other VoAg Teachers	7.19	1.05	5.00 - 9.00

[a] Values were coded: No Value = 1, Average Value = 5, and Utmost Value = 9.

[b] Range of scale values provided by experimental group instructors.

Experimental and control group class means were compared to determine differences in instructional effectiveness. Covariate analysis allowed the researcher to compare posttest treatment group means after controlling for pretest differences. Classes in the experimental treatment group scored, on the average, nine percent higher on the Knowledge Inventory posttest than did control group classes. Regression analysis revealed the experimental treatment effect was able to explain over 20 percent of the variance associated with posttest knowledge class means. The researcher therefore concluded that use of the instructional unit was more effective than using instructional materials traditionally used by instructors in the subject matter area.

Student characteristics examined as part of this investigation accounted for over half (56.14%) of the variance associated with posttest knowledge scores. Students reportedly receiving higher letter grades and higher pretest knowledge scores tended to score higher on the posttest Knowledge Inventory. Students planning to work in an agribusiness directly after high school graduation tended to produce lower knowledge scores. This finding led the researcher to conclude that academically successful students exhibited greater levels of achievement, whereas, students entering the work force directly after high school may not have felt as great a need to study Agriculture/ Agribusiness Management at that point in time.

Student characteristics identified as significant predictors of posttest attitude scores accounted for approximately 44 percent of the variance associated with such scores. Pretest attitude scores were found to explain 41 percent of that variance while the number of semesters of science classes and years of FFA membership combined increased the explained variance by three percent. As a result, attitude scores were assumed to have been influenced by many other factors which were not examined as part of this investigation.

Individual teacher and school situational characteristics were generally less valuable in predicting posttest knowledge and attitude inventory class means than student information to predict student scores. This finding led the researcher to conclude that student achievement and attitudes were more a function of individual student characteristics rather than a classroom phenomenon.

In the main, experimental teachers responded favorably to the quality and value of the prepared instructional unit. Technical accuracy of the unit was perceived to be its greatest quality. Each characteristic examined produced means above the midpoint of the response scale. Also, the most-valued aspect of the instructional unit appeared to be the reduction in preparation time needed to teach the subject matter. Many instructors provided written comments expressing a desire to expand the scope and content of the instructional unit and to produce similar units in other subject matter areas.

As a result of the findings of this investigation, the researcher concluded the Agriculture/Agribusiness Management instructional unit was an effective aid which may be used by teachers in planning, preparing and delivering instruction in the subject matter area.

RECOMMENDATIONS

Based on the findings and conclusions resulting from this investigation the following recommendations were offered for future instructional material developers and researchers. Although these suggestions may not be generalized to all Iowa vocational agriculture instructional programs on a statistical basis, they may have implications for this and other groups if interpreted with a degree of caution and logic.

Instructional materials developed for use in vocational agriculture classes should be subjected to rigorous evaluations to determine their effectiveness. Traditional instructional materials should be replaced by materials which are found to be more effective by enhancing the 'teaching-learning' process.

Special efforts should be made to identify the needs of the population which vocational agriculture programs of the future will be serving. As agriculture, technology and student needs change, curriculum materials must be revised or developed incorporating the new technology in order to fulfill the needs of a widely divergent student clientele.

Future instructional materials should also be developed to reduce the time required for teachers to prepare their lessons. Reducing instructional preparation time will allow teachers to allocate more of their time to other important aspects of the vocational agriculture program.

Vocational agriculture teachers of the future may be trained as "professional educators" and specialists in educational technology, relying more heavily on instructional materials and subject matter specialists to provide the needed technical information. This scenario, although futuristic, has become apparent as we examine the changes which have occurred in teacher training programs in recent years.

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EXPERIMENTAL EVALUATION OF AN INSTRUCTIONAL PACKET ON SUPERVISED OCCUPATIONAL EXPERIENCE PLACEMENT PROGRAMS FOR VOCATIONAL AGRICULTURE*

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INTRODUCTION

Supervised occupational experience (SOE) programs are characterized as an integral part of the instructional program to equip vocational agriculture students with experiences for agricultural occupations. With more non-farm youth enrolled in vocational agriculture and more students obtaining experience through cooperating agricultural businesses, preparation for occupational experience gains in importance (U.S. Office of Education, 1967). Research conducted by Pilgrim (1983) and Fletcher (1983) revealed that preparatory instruction in selecting and developing SOE placement programs should be provided in the vocational agriculture class. The primary responsibility for providing this instruction rests with the vocational agriculture teacher (Briers, 1978).

A dilemma arises of how to provide adequate instruction on SOE placement programs with teacher preparatory time at a premium. To assist teachers with this problem, an instructional packet containing subject matter content and instructional aids was developed (Williams, 1983a) to reduce preparation time and insure appropriate content. The instructional packet was developed for vocational agriculture teachers to use in teaching advanced students how to develop SOE programs that include placement (employment) in agricultural businesses and on farms. Research conducted by Pilgrim (1983), Fletcher (1983), and Williams (1983b and 1983c) suggested content and methods to include in the packet.

The effectiveness of instructional materials is unknown until the materials have been tried in the classroom and evaluated in terms of whether or not they have brought about the desired behavioral changes in students (Ridenour, 1965). Briers (1978), Townsend (1981), Birkenholz (1982), and Hosseini (1982) advocated evaluation of instructional materials to determine their teaching-learning value. Thus, a study of the SOE placement program instructional packet was the thrust of research completed at Iowa State University (Slocombe, 1983).

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*This research was completed as part of Project 2384 of the Iowa Agriculture and Home Economics Experiment Station, Iowa State University, Ames, Iowa.

OBJECTIVES OF THE STUDY

The purpose of the study was to determine the effectiveness of the instructional packet on preparing students for SOE placement programs as evaluated by (a) student knowledge of SOE placement programs, (b) student attitude toward SOE placement programs, and (c) student SOE placement program planning. A secondary objective was to describe personal and situational characteristics of sophomore vocational agriculture students in selected schools in central Iowa.

METHODS AND PROCEDURES

Design and Sample

A posttest control group experimental design was used in the investigation. A sample of 40 schools was randomly selected from the population, defined as those schools offering vocational agriculture in the north central and south central vocational agriculture/FFA districts in Iowa during the 1982-83 school year. The sample was divided randomly into two groups of 20 schools each; one group of schools was assigned to the experimental treatment and the other group served as the control treatment. The experimental units consisted of sophomore vocational agriculture classes while the students comprised the sampling units.

Description of Treatment Levels

The independent variable that was manipulated by the researcher was the degree to which teachers had access to the instructional packet on SOE placement programs. Two levels of the experimental variable were used: (1) The experimental treatment group was provided the instructional packet. (2) The control treatment group was provided with a list of problem areas, study questions, suggested references, and learner needs outlined in the instructional packet. These teachers were instructed to use materials and methods they would ordinarily use to teach their sophomore students about SOE placement programs.

Monitoring of Treatment

To insure that the treatment was administered within the constructs of the investigation, the experimental and control treatment groups were monitored during the experiment through on-site visitations and telephone conversations. A minimum of three telephone conversations were conducted with each teacher during the experiment to assess their progress in teaching the unit. Further monitoring of the experiment was performed through on-site visitations to three schools in each treatment group. The visitations enabled the researcher to observe the experimental and control treatments being used by vocational agriculture teachers in preparing students for SOE placement programs.

Dependent Variables and Instrumentation

One instrument containing four parts was developed to measure the dependent variables and to elicit personal and situational information from the students.

Part I--SOE Placement Program Knowledge Inventory. A criterion referenced test of 24 multiple-choice items with four alternatives each was used to assess each student's knowledge of SOE placement programs. To insure face validity, the knowledge inventory was field tested using a class of sophomore vocational agriculture students not involved in the study. The knowledge inventory was administered as a posttest and yielded a reliability coefficient of .698. The inventory was scored and reported on a percentage basis.

Part II--SOE Placement Program Attitude Inventory. To measure each student's attitude toward SOE placement programs, an attitude inventory utilizing the semantic differential technique was developed. Research conducted by Kotrlik (1978), McMillion (1966), Birkenholz (1982), and Hosseini (1982) reported success with the semantic differential technique with vocational agriculture students. The instrument consisted of six broad attitudinal concepts, two from each problem area of the instructional packet, with six seven-step scales bound by appropriate bipolar adjectives. The bipolar adjectives were taken from those recommended by Osgood et. al. (1[illegible]), the originators of the semantic differential technique. The adjectives were selected on the basis of the dimension of meaning they represented, and their appropriateness for the concept being measured. To insure face and content validity, the attitude inventory was field tested with a class of sophomore vocational agriculture students not involved in the study. The attitude inventory was administered as a posttest with the concepts and their bipolar adjectives randomly arranged.

Factor analytic techniques revealed that six distinguishable concepts were measured by the instrument. In addition, intercorrelations among subscales were positive and homogeneous. The attitude inventory yielded a reliability coefficient of .948. These findings supported the procedure used in computing a summative attitude score.

Part III--SOE Placement Program Planning Inventory. This inventory was developed to assess the degree to which students had selected and planned their individual SOE placement program. Each of 14 statements describing a SOE placement program planning activity was weighted on a 1 to 9 importance scale by a jury of teacher educators as an indicator of good SOE placement program planning. Then, questions that elicited yes or no responses from the students were developed based on the original statements. The inventory, administered postexperiment, yielded a reliability coefficient of .711. A summative score was produced by adding the weighted values (jurors' mean importance scores) for yes responses of each student. Inventory scores were reported on a percentage basis.

Part IV--Student Data Questionnaire. This instrument was administered postexperiment to collect student data related to selecting and planning SOE placement programs in vocational agriculture.

Collection of Data

Teachers in both the experimental and control treatment groups administered the data collection instruments to their students. The instrument was mailed shortly before teachers completed their SOE placement program units. Usable data were obtained from 15 schools in the experimental treatment group and 14 schools in the control treatment group. A total of 322 student responses were received.

Analysis of Data

The effectiveness of the instructional packet was tested using the t-test. Student characteristics were assessed by nominal variables; thus, percentages were used to summarize the descriptive information.

RESULTS

The findings, conclusions, and recommendations will be closely tied to three hypotheses, following a brief description of the respondent.

Previous descriptive studies by Briers (1978), Williams (1977), and Byler and Kaas (1976) on Iowa vocational agriculture students have shown a very production-oriented background. These studies, however, assessed freshmen, juniors and seniors. Table 1 shows the characteristics and situations of sophomore vocational agriculture students in selected schools in central Iowa during the 1982-83 school year.

Table 1. Characteristics and situations of sophomore vocational agriculture students in central Iowa, 1982-83

Characteristic or Situation	Percentage*
Place of residence	
City or town	24
Rural area, not a farm	12
On a farm	64
Type of present SOE	
Animals and/or crops	58
Farm placement	16
Agribusiness placement	8
Laboratory - school facilities	4
None	14
FFA Membership	
Yes	88
No	12
Preferred employment experience before graduating from high school	
Production agriculture	50
Agricultural mechanics	19
Forestry	1
Horticulture	1
Agricultural sales and service	6
Agricultural processing	4
Natural resources	10
Other	2
Non-agriculture	7
Occupational Plans	
Production agriculture	38
Off-farm agriculture	33
Non-agriculture	11
Undecided	18
Attend a vocational school, college, or university after high school graduation	
Yes	65
No	35

*n = 322 students from random sample of 29 schools

Contrary to similar studies of Iowa vocational agriculture students, 24 percent of the sophomore students lived in a city or town. Similarly, 28 percent of the students were involved with SOE placement programs and 50 percent were interested in obtaining employment experience in off-farm agricultural occupations before high school graduation. Almost equal numbers of students indicated a strong interest in pursuing production agriculture and off-farm agricultural occupations upon completion of their formal education. Finally, 65 percent of the students planned to obtain post-secondary education after high school graduation.

The assessment of the instructional packet involved tests of hypotheses comparing the SOE placement program knowledge scores, the SOE placement program attitude scores, and the SOE placement program planning scores of the experimental and control treatment groups. The .05 level of probability was used in testing the hypotheses.

Ho_1: There is no significant difference between the SOE placement program knowledge scores for the experimental and control treatment groups.

The t-test was used to test for significant difference in means between treatment groups. Table 2 shows the experimental treatment group had a higher knowledge score than the control treatment group. Similarly, the experimental treatment group had a higher standard deviation than did the control treatment group. This indicated that there was a greater variation between scores in the experimental treatment group. The t-value of 1.26 indicated the means of the SOE placement program knowledge scores were not significantly different. Therefore, the data supported the null hypothesis; it was not rejected.

Table 2. T-test of SOE placement program knowledge score

Treatment Level	N	Mean	S.D.	t-value
Experimental	15	65.97	9.44	1.26ns
Control	14	61.72	8.77	
Total	29	64.50	15.01	

Ho_2: There is no significant difference between the SOE placement program attitude scores for the experimental and control treatment groups.

The t-test was used to test for significant difference in means between treatment groups. Table 3 shows the experimental treatment group had a higher attitude score than the control treatment group. A low standard deviation in the attitude scores of both treatment groups indicated that student responses were uniform. A t-value of .70 revealed no significant difference existed between the mean scores for the experimental and control treatment groups. Therefore, the null hypothesis was not rejected.

Table 3. T-test of SOE placement program attitude score

Treatment Level	N	Mean	S.D.	t-value
Experimental	15	5.66	.361	.70ns
Control	14	5.56	.426	
Total	29	5.65	.771	

Ho$_3$: There is no significant difference between the SOE placement program planning score for the experimental and control treatment groups.

The t-test was used to test for significant difference in means between the experimental and control treatment groups. Table 4 shows the experimental treatment group had a higher mean score than the control treatment group. A t-value of 1.29 revealed no significant difference existed between the mean scores for the experimental and control treatment groups. Thus, the null hypothesis was not rejected.

Table 4. T-test of SOE placement program planning score

Treatment Level	N	Mean	S.D.	t-value
Experimental	15	40.10	8.38	1.29ns
Control	14	34.88	12.84	
Total	29	38.31	20.80	

Recommendations

Based on the findings of this study, the following recommendations should be given consideration by those responsible for the administration, supervision, and operation of vocational agriculture programs.

1. Teacher educators and state supervisors of Agricultural Education should emphasize to teachers the importance of utilizing various types of SOE programs to meet the needs of all vocational agriculture students.

2. Teachers should provide all vocational agriculture students instruction about SOE placement programs. Furthermore, they should encourage junior and senior vocational agriculture students with occupational objectives related to agribusiness to select, plan, and implement SOE placement programs.

3. The SOE placement program attitude inventory and SOE placement program planning inventory could serve as a reliable measure of student attitude and planning of SOE placement programs. However, the SOE placement knowledge inventory should be lengthened in an attempt to increase its overall reliability.

4. A follow-up study of these students to determine long-term effects of the SOE placement program instructional packet on their involvement in SOE placement programs should be conducted.

5. Experimental investigations of concepts, procedures, and materials in vocational agriculture should be conducted whenever feasible. These investigations should be personally monitored by the researcher to insure that treatment is being administered.

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AN ASSESSMENT OF ATTITUDES, NEEDS, AND DELIVERY SYSTEM FOR MICROCOMPUTER APPLICATIONS BY AGRICULTURAL AND EXTENSION EDUCATORS IN MISSISSIPPI

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INTRODUCATION/NEED FOR THE STUDY

Problem Studied

Educators and educational agencies are challenged with the responsibility of helping people understand and make the best use of technological advancements, such as microcomputers. Vocational agriculture teachers and Extension agents are two primary groups who have such a defined educational role. They are faced with a two-fold task and becoming knowledgeable of computers themselves and training others to use computers and computerized equipment in their work.

Related literature and research have indicated problems associated with computer usage that reflect inadequate planning and lack of understanding the environment for technological change (Eiselle, 1980, Hamblen, 1981, Romstad, 1981, Uthe, 1982). Before expecting immediate use of computer knowledge efforts have to be made to assess current attitudes and needs of potential users. A study of these attitudes and needs can provide insight into the extent of training, as well as types of training, that is needed to reach the potential end-use desired.

The question under study in this investigation was: What are the attitudes, knowledge and skills of vocational agriculture instructors and Extension Service county field staff with regard to the use of microcomputer technology? Furthermore, what are the needs and desired methods of obtaining the competencies necessary to assist clientele in the use of microcomputers?

Need for the Study

Many reasons have been expressed for individuals' reluctance to accept computers within the work force. Not enough attention to the needs of the individuals (Cole, 1982), personal hostility (Keen and Dischart, 1982), and fear (Abshire, 1982) are just a few recognized problems. The "people" roadblocks have to be overcome to successfully gain the potential benefits from the microcomputer.

There has been a great deal of research in the last two decades evaluating the integration of computers into the curriculum. Also, there has recently been evaluative efforts specific to agriculturally-related microcomputer software, primarily in agricultural economics and farm management used within formal and informal educational situations (Argo, 1980; Ford, 1982; Wilsdof, 1979).

However, with most research, the primary interest has been on student use of other clientele use, such as farmers and agribusiness firms. There has been little research reported that has dealt with the educator faced with rapidly changing technology. The educators' needs have been overlooked, yet, they are faced with the expectation to be competent with use of new technology such as the microcomputer.

Therefore, there is the need to determine existing attitudes and preception of educators toward microcomputer use within their work. In addition, it is necessary to determine educators' needs in order that inservice educational efforts will meet those perceived needs and not be a token effort with decisions made solely by administrators. Such token efforts can often generate cynicism and apathy, two virulent attitudes for educators.

Human reluctance to change from the old to the new, whatever reasons may exist, creates management problems. Knowing if a problem exists and understanding it is the first step to overcoming the problem.

OBJECTIVES OF THE STUDY

The primary objectives of this study were as follows;

1. Determine selected individual characteristics, computer experiences and training of agricultural and extension educators.
2. Determine agricultural and extension educators' receptiveness toward the use of microcomputers.
3. Determine the perceptions of agricultural and extension educators toward the utility of microcomputers within their educational program.
4. Determine agricultural and extension educators' desired training needs and delivery methods for microcomputer technology.
5. Determine agricultural and extension educators' anticipated problems associated with future use of microcomputers.

METHODS AND PROCEDURES

Population and Sample

The population for this study consisted of 252 Extension professional field staff and 262 secondary vocational agriculture instructors in Mississippi. A sample of 60 percent was drawn from these groups of educators serviced by the Department of Agricultural and Extension Education for a total of 309 participants. A proportional stratified random sample of 152 Extension professionals, representing county agents, home economists, and 4-H youth agents from each of the four extension districts, was drawn for study. A proportional stratified random sample of 157 vocational agriculture instructors from each of the four supervisory districts was included in the total sample.

Instrumentation

The research instrument was constructed with two parallell forms: one for Extension professionals and one for vocational agriculture instructors. It consisted of four parts to assess: 1) the individual characteristics, previous computer experiences and training, and attitudes toward microcomputers; 2) the utility of microcomputers; 3) the desired training delivery methods and the training needs for use of microcomputers; and 4) the anticipated problems associated with microcomputer use.

Pilot Test

During the week of September 27 to October 4, 1982, the instruments were administered to a group of professionals not included in the sample. The purpose of the pilot testing was to assess the reliability of the instrument. The two parallel versions of the instrument were administered to different groups of professionals.

Reliability coefficients, using Statistical Package for Social Sciences (SPSS) procedures, were obtained for the scale measurments of attitudes toward microcomputers, utility of microcomputers, and training needs.

A reliability coeffeciant of .72 was computed for the attitude toward microcomputer scale for the group of Extension professionals. A reliability coefficient of .77 was computed for the same scale for vocational agriculture instructors. For both groups, a reliability coefficient of .74 was computed.

Separate reliability coefficients for vocational agriculture instuctors and Extension professionals were computed for the scale measurments of utility of microcomputers since the items within this measure differed for the two groups. The reliability coefficient of .95 was computed for the utility of microcomputers scale measurements for Extension professionals. The reliability coefficient of .88 was computed for the utility of microcomputer scale measurement for vocational agriculture instructors.

For the scale measurement of training needs, a reliability coefficient of .82 was computed for Extension professionals and a coefficient of .95 was computed for vocational agriculture instructors.

Data Collection

The data were collected from 145, or 95 percent of the Extension professionals and 107, or 68 percent, of the vocational agriculture instructors for a total of 252, or 81.6 percent return. There were 14 returned research instruments with nonusable data due to expressed lack of knowledge by the participants. Therefore, the total usable returns were 238, or 77 percent, with 58.8 percent being Extension professionals and 41.2 percent representing vocational agriculture instructors. Data were collected from the period of October 11 to November 12, 1982 by a mail questionnaire.

RESULTS: FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Findings

Respondents by Selected Individual Characteristics

With the primary intent of this study to describe existing conditions, the participants were asked to respond to items in Part I of the questionnaire that described their present personal and employment characteristics, previous microcomputer use and training opportunities.

Participants were classified into four categories according to their professional position. The respondents by position were county agricultural agents (23.5 percent), home economists (18.9 percent), 4-H youth agents (16.4 percent) and vocational agriculture instructors (41.2 percent).

The length of employment of respondents ranged from less than one year to 36 years with an average of 15 years. The majority (73.5 percent) of the respondents were male. This finding is primarily a result of their professional position.

The educational level of respondents was classified into three categories. Thirty-four percent of the respondents had a B.S. degree, 38 percent had a masters degree and 27 percent had graduate work beyond a masters'. Age of respondents was classfied into five categories with the largest number (31.2 percent) of the respondents between the ages 26 and 35 years of age.

The majority of the participants (73.5 percent) reported no previous use of computers, including microcomputers. Only 26, or 10.9 percent, of the respondents had a microcomputer available for use.

Of the 26 respondents with a microcomputer available 16 reported a range of use from 0 to 29 hours per week with an average of 3.65 hours. The majority of respondents (183, or 76.9 percent) had not received any specific training about the use of microcomputers. Of these respondents reporting microcomputer training (55, or 23.1 percent), inservice workshops had provided the primary means for training. The second most reported means of training was a college course for graduate credit.

Relationship Between Computer Experiences and Microcomputer Training of Respondents Grouped by Professional Position

The first objective of this study was to determine if any significant relationships exist in the respondents' computer experiences and training when grouped by their professional position as agricultural and extension educators.

There were no significant relationships existing between either variable computer use or availability of microcomputer and the position of the respondents. However, a significant relationship ($p<.01$) between the respondents' professional position and their previous microcomputer training existed when data were analyzed by a Chi-square test independence. A Cramer's V of .40 was calculated to represent the strength of the relationship. The two groups with a large number of respondents having received some training were the Extension home economists and the county agricultural agents. Fifty percent of the county agricultural agents responding had received some type of training, whereas, agriculture instructors had received very little.

Attitudes Toward Microcomputers

Agricultural and extension educators, responding to the questionnaire, appear to present a favorable attitude toward microcomputers based on mean ratings of the 12 items measuring attitudes.

A varimax rotated factor analysis of the responses to the attitude statements was used to identify factors for group comparison of response ratings among the four groups of agricultural and extension educators and as a predictor variable with other variables under study.

The analysis revealed three factors and were summarized as: (1) negative attitudes toward microcomputers, (2) change in job responsibilities with microcomputer use and (3) limited use of microcomputers.

The three factors resulting from participants' responses of the attitudes toward microcomputers were analyzed for any difference among them and selected individual characteristics. There was no difference in respondents' attitudes when grouped by professional position, years of employment, age, or educational level.

A t-test was used to analyze the impact the previous use of a computer by participants had on their attitude toward microcomputers. The analyses revealed, for all three factors of attitudes, that participants who had some experience with computers expressed more favorable attitudes toward microcomputers.

Also analysis revealed significant differences in attitudes for all three factors when participants were grouped as to whether they had received any specific microcomputer training ($p < .01$).

Perceptions of Uses of Microcomputers

The third objective of the study was to determine respondent's perceptions toward microcomputer uses. Respondents were asked to indicate which one of four categories would be descriptive of the major use of microcomputers within their programs. The four categories and participants' responses were: (1) information storage and retrieval (35.5 percent), (2) decision-making tool for clientele (27.6 percent), (3) an additional delivery method for instruction (19.5 percent), (4) office or classroom management (16.8 percent).

Significant relationships ($p < .01$), existed between respondents' position and their selection of three of the four categories. The category of information storage and retrieval receiving 35.5 percent of the responses was the selection that was not associated to the position of the respondents. County agricultural agents and home economists appear to indicate, by frequency of response, greater use of the microcomputer as a decision-making tool for clientele. More vocational agriculture instructors, however indicated use for microcomputers as an additional instructional method. Also more Extension professionals indicated office management as a major use of the microcomputers than did vocational agriculture instructors.

Extension county agricultural agents were perceived by all respondents to have the greatest use for microcomputers. The Extension home economists were considered the second group of professionals to benefit the most from the use of microcomputers. There were no significant differences in either of these ratings and the position of the respondents. The lowest mean rating for the four professional groups in terms of greatest use of microcomputers was the vocational agriculture instructor. However, a significant differences in this rating by respondents and their professional position existed. The county agricultural agents rated benefits to the vocational agriculture instructor lower than did the Vo-Ag instructors.

The instructional situation rated as the most conducive to the use of microcomputer was individualized instruction. This rating did not differ among respondents when grouped by professional position. The instructional situation rated as the least conducive to the use of microcomputers was large group instruction. However, there was an observed difference ($p < .05$) between returns by county agricultural agents and vocational agricultural instructors. Vocational agriculture instructors indicated a higher mean rating with regard to the extent of use that microcomputers could have within a large group instructional situation.

Perceptions of Specific Microcomputer Uses by Vocational Agriculture Instructors

The major use for the microcomputer in vocational agriculture programs, as perceived by the instructors, is for farm management, recordkeeping and inventory needs. This use was indicated by the highest reported mean of the 26 specific uses respondents were asked to rate.

The clientele group that vocational agriculture instructors perceived would benefit most from microcomputer use was small business operators or owners.

Perceptions of Specific Microcomputer Uses by Extension Professionals

The use rated as having the greatest utility to Extension professionals was for mailing list purposes. The 26 potential uses were factor-analyzed for group comparisons among respondents by position within Extension. Five factors were revealed. The uses were summarized as: (1) home economics, (2) office management, (3) agricultural, (4) storage and retrieval, and (5) self-instructional. There were significant differences ($p<.05$) in the perceived uses for microcomputers among Extension professionals when grouped by position. These differences were observed for home economics uses, storage and retrieval uses, and self-instructional uses.

Agricultural producers were rated by all Extension professionals as the clientele group to benefit the most from use of microcomputers.

Desired Training Needs

There were 14 identified items related to microcomputer competencies that respondents were asked to rate as important needs within a training program. The three most important needs that a training program should address as indicated by mean ratings of respondents were: (1) a knowledge of the uses that microcomputers can provide the participant, (2) the ability to incorporate microcomputers into participants' individual programs, and (3) how to run packaged programs for microcomputers. However, all 14 items received high ratings and would seem to be important within a training program.

Further comparisions were made among the mean ratings of each training need when grouped by professional position of the participants. It appears that county agricultural agents and vocational agriculture teachers have a better knowledge of the services that a microcomputer can perform to benefit their clientele than did home economists and 4-H agents.

County agricultural agents rated the need for a knowledge of different types of microcomputer equipment, capabilities, and uses significantly lower ($p<.05$) than did vocational agriculture instructors.

These two groups of educators also differed significantly on their needs for selection, purchase and care of microcomputers.

Desired Training Delivery Methods

There were 75.5 percent of the respondents who expressed that training should be on a voluntary basis, not mandatory. Sixty-three percent of the respondents indicated that training should be the primary responsibility of the individual rather than the employer. There was an observed relationship ($p<.01$) between participants' professional position and these beliefs toward training responsibility. Seventy-eight of the 94 vocational agriculture instructors indicated individual responsibility for training.

For 63 percent of the respondents, training in microcomputers was not considered a priority within their program at the time of this study. However, 96 percent of the respondents were willing to participate in training. Also 92 percent of the respondents preferred training prior to acquiring a microcomputer for use.

Over half of the respondents (56.4 percent) preferred inservice education with college credit. The response was related to the professional position of the respondents. Vocational agriculture instructors indicated the greatest number of responses indicating agricultural and extension education for the preferred delivery of instruction.

Anticipated Problems

The last objective of the study was to determine agricultural and extension educators' perceptions toward potential problems were assessed by requesting respondents to rank them from one to seven, according to their relationship toward participants' area of work.

Respondents were asked to rank the potential problems from one (most relevant problem) to seven (least relevant problem). The most prevalently anticipated problem with a mean of 1.68 is the lack of funding. Rankings of anticipated problems when compared among respondents grouped by professional position did reveal significant relationships.

Lack of finding was ranked as more relevant to vocational agriculture instructors than Extension professionals. County agricultural agents ranked "lack of administrative support" as less relevant than the respondents in the other three positions. However, county agricultural agents ranked more concern toward easy access of microcomputers for immediate use than other respondents. Vocational agriculture instructors expressed more concern over "limited equipment for instructional purposes".

Conclusions

Based on findings, the following conclusions were made about the perceptions of microcomputer technology by agricultural and extension educators in Mississippi:

1. Participants had a favorable attitude toward microcomputers. However, more positive attitudes were expressed by participants who either had previously used a computer or had participated in some type of microcomputer training.
2. Based on frequency of responses by the participants, information storage and retrieval was indicated as the major category of use for the microcomputer.
3. Participants preferred a voluntary training program for microcomputer use and they viewed themselves as having primary responsibility for acquiring the training.
4. Participants are very willing to participate in training in the use of microcomputers, although, it may not be a priority for many of them.
5. Microcomputer training opportunities are preferred prior to acquiring a microcomputer for use within programs.

Recommendations

The following recommendations are made on the basis of the findings of this study:

1. Teacher education programs and employers need to provide more training opportunities, both preservice and inservice, for vocational agriculture instructors and Extension county field staff to enhance educators' attudes toward microcomputers and their use.
2. Training programs should include an opportunity for all participants, regardless of position, to increase their basic knowledge of how microcomputers can benefit them and how microcomputer use can be incorporated into programs to meet their needs.
3. Emphasis within training programs for vocational agricultural instructors need to incorporate a description of the different microcomputer systems available their capabilities, as well as selections, purchase, and care needed. Also, vocational agriculture instructors need more assistance on how to use a microcomputer within larger groups for formal instructional purposes.
4. The opportunities for use of microcomputers within delivery of programs other than individualized situations for Extension professionals need to be explored.
5. Alternative funding for microcomputers for agricultural and extension educators need to be explored in order to assist participants with problems of funding.

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PREPARATION, PLACEMENT AND RETENTION OF TEACHERS
A DISCUSSION OF RESEARCH

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INTRODUCTION

For several years there has been much concern over the preparation, placement and retention of teachers, with several states having an almost perpetual shortage of teachers. Research on why teachers enter and leave teaching has been popular for the past decade and it seems that at least half of the states have conducted such studies.

The research reports which are to be discussed in this paper deal with the same topic, but each effort approached the problem from a different perspective with a somewhat different purpose. The papers are: "Oregon Vocational Agriculture Teacher Placement and Retention Factors", by Lee Cole; "Trends in the Preparation, Demand and Mobility of Secondary Vocational Agriculture Teachers in Ohio, 1970-1983", by R. Kirby Barrick, George W. Wardlow and J. Robert Warmbrod; and "Actual and Desired Role Perceptions of Teachers of Vocational Agriculture" by Ismail bin Yahya and Michael F. Burnett. Comments made regarding these research efforts are intended to promote discussion of the reports, the methodology employed, and implications of the results.

OREGON VOCATIONAL AGRICULTURE TEACHER PLACEMENT AND RETENTION FACTORS

This research attempted to discriminate between agricultural education graduates who never taught, those who started teaching and left, and those who are still teaching. The introduction of the paper, which was well written, focused almost entirely on the quality or appropriateness of preparation in technical agriculture, yet the criterion variables used included those dealing with technical agriculture, professional preparation and personal and professional concerns, as well as years of high school vocational agriculture, years of FFA, years of SOE, years and quality of work experience, type of high school attended, type of school in which student teaching was done, quality of instruction, SOE and FFA at the student teaching site, and whether or not the graduate attended a community college. What was introduced as a simple study to determine the influence of technical agriculture preparation on the retention of teachers became a complex review of the influence of about 60 variables on retention.

Commendations are due the researcher for ambitiously attempting a popular research topic. Improving the placement and retention of teachers is certainly more cost-effective than preparing additional teachers. I was particularly interested in responses to the open-ended question which asked for the most important reason in favor of and in opposition to teaching. Its not surprising, but is comforting to see that teachers who stay in teaching "enjoy teaching" and "like students." Those not teaching gave reasons such as "inadequate salary," "long work hours," and "other job opportunities" as major reasons for not teaching.

There are points however, that should be raised about parts of the study which limit its usefulness. A basic and essential element of any research is that the data on which we base decisions be dependable. For two reasons the data collected in this study are questionable. First, there may be a non-response bias, with 34% of the population not responding; it is further confounded by a 50% response rate from those who never taught compared to a 69% rate for those who taught and left teaching, and a 75% response rate from those still teaching. The paper made no mention of any effort to account for this bias. (See Report).* The data are questionable also because no evidence is presented to support instrument validity and reliability. The accuracy with which subjects recall information over as many as 12 years is doubtful and the nature of some of the items themselves causes one to wonder about how consistently they were interpreted by respondents. (See Report). For example, how can those who never taught respond to items 15-19, 21-25, and 44-46? Answers to these are, at best, based on limited information and experience. Other questions could be asked about data collection procedures, such as:

- What is the difference between items 16 and 40, which are placed in different categories?
- Did respondents answer based on their perceptions at the time they answered the items or at the time they decided not to teach?
- On what basis were items grouped into categories?
- How was "Extremely Active" in FFA and SOE measured?
- How was "Excellent Quality" of work experience measured?
- How was "Very Good-Excellent" instruction, SOE and FFA at the student teaching center measured? By whom?

Assuming valid and reliable data which represent the target population, there is another point that should be raised--data analysis and interpretation. A minor point concerns the continuing debate regarding the use of statistical tests with population data. Most of us would agree, I think, that when the sample equals the population, as in this case, there is no need to statistically test the probability of chance errors between the sample and the population. Some would say, though, that this population is a sample of future populations. If this position is accepted, we must ask whether or not it is representative of future populations.

Examples of the misinterpretation of data and the confusion over practical versus statistical significance follows. One of the findings reported was that those still teaching rated their professional preparation (items 15-20) statistically significantly higher in all but one item than those who never taught and those who taught and left. (See Report). Note however, that the lowest rating by any group is 3.08, which according to the scale, is more of a positive influence than a negative one. None of the ratings influenced any of the groups not to teach. If statistically differences were appropriate, there is no practical significance.

Another finding was that mean scores in the technical agriculture preparation category (items 1-14) are lower for those who never taught than for the other two groups. (See Report). The table reveals, though, that this is not true. In 6 of the 14 items the means for those who never taught are higher than one or both the other groups. An additional four items have means that are higher for those who taught and left than for those still teaching. Furthermore, in the remaining four items where means are lower for those who never taught, the differences are of no practical value. All but one of the means for all three groups on all 14 items are above 3.0, which, according to the scale, indicates that the quality of preparation in technical agriculture did not influence any of the groups to choose a career other than teaching. Therefore, even though we all agree with the need for high quality preparation in technical agriculture, the recommendation that it be improved to increase teacher placement and retention is without basis and should not be made.

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*Report refers to the research report being discussed.

Another finding stated in the paper is that people generally leave teaching because of concerns for time, money and lack of classroom control, whereas, people stay in teaching because of acquisition of technical agriculture and professional education skills and due to student interest in vocational agriculture. This finding, too, is based on differences between means of the three groups, when in actuality the differences are of no practical significance. The conclusion is, therefore, in error.

Another part of this study involved multiple discriminant analysis, which was used to determine which of the 46 items most effectively discriminated between the three groups of respondents. Multivariate analysis techniques, including discriminant analysis, are and should be used more frequently in educational research. The appropriateness of discriminant analysis in this study, however, is doubtful. "The effectiveness of discriminant analysis rests on the existence of predictor variables which differ in mean value from one criterion group to another. If groups do not differ on the individual predictor variables, it is unlikely that they will differ on the derived discriminant function. On the other hand, chance differences between groups on the individual predictor variables could accumulate to produce apparent discrimination between the groups."[1] This study did show 20 items as a function which discriminated between the three groups, explaining 53% of the variance. This could, though, be due to chance differences between groups since there is very little practical difference between the groups on the 20 items.

Another weakness of this particular application of discriminant analysis is in determining predictive accuracy or validating the discriminant functions. When the functions are validated with the same group used to develop the function, an upward bias in predictive accuracy results.

TRENDS IN THE PREPARATION, DEMAND AND MOBILITY OF SECONDARY VOCATIONAL AGRICULTURE TEACHERS IN OHIO, 1970-1983

This research was designed to answer four questions regarding vocational agriculture teacher trends: number of positions in teaching at the secondary level, type of preparation (B.S. in teacher education in agriculture, B.S. in technical agriculture, and non-degree), demand for teachers, and number of teachers leaving the profession and the occupations they enter. The research presented is effective in answering these questions.

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[1] Kachigan, Sam Kash. Multivariate Statistical Analysis. N.Y.: Radius Press, 1982 (pp 219, 229).

A succinct introduction leads to the problem and to a clear statement of research questions. The review of literature is well written but leads with a claim that the shortage of teachers brought about changes in the preparation of teachers to meet the demand. It is possible, however, that the teacher shortage caused more changes in teacher certification than in teacher preparation. Another strength of this research is the number of cases assessed over a long period of time, which is needed for answering questions about trends.

The methodology is tersely written and not very explicit. Reading the methodology section left questions unanswered, such as exactly how data were collected and were there non-respondents? And, not that it is incorrect, but line graphs portray trends more effectively than tables like these used in the paper.

The data that are presented are used well in answering the research questions. Generally, the data collected for this descriptive study are not used to imply conditions that do not exist, as is often the case. I would question, though, the basis for the statement that "there appears to be a relationship between the annual percent of teachers leaving the profession and the percent of entering teachers who have no B.S. degree and are not professionally prepared as a teacher of vocational agriculture." I, too, would like to believe that "non-degree, non-professionally-trained" teachers fail to cope as well as the professionally-trained teachers and, thus, leave the profession. If I calculated the correlation correctly, though, there is only 1% of variance in common, which is about the same as for professionally trained teachers (See Figure 1). The writers did suggest this and other topics as being suitable for further research. I believe the suggestions are good.

ACTUAL AND DESIRED ROLE PERCEPTIONS OF TEACHERS OF VOCATIONAL AGRICULTURE

This study asks a sample of Louisiana vocational agriculture teachers to rate the desirability of 21 roles for the success of the teacher and the program. Discrepancies were identified and quantified between actual and desired roles. Teachers were also asked to rate 19 factors according to their influence on teacher and program success.

The introduction brings up the concept of role conflict as related to vocational agriculture teachers. No doubt, this is a relevant concept since the profession itself differs on the specific purposes of vocational agriculture. For example, there is quite a lot of debate currently on job-specific versus more generalized vocational education. To say the least, role conflict can be frustrating to teachers, so a study designed to identify a possible discrepancy in actual and desired roles of vocational agriculture teachers should have merit. The objectives seem to be consistent with this purpose and to be obtainable. With this concept being studied for some time in sociology, a considerable amount of information should be available in the literature, but no literature was cited, possibly due to space limitations.

There are several commendable aspects of this research. Data were collected from a random sample of teachers with three or more years of experience. Ninety-seven percent of the sample responded, which is remarkable. Instrument reliability was measured by Cronbach's Alpha, with reported reliability ranging from .83 to .93 for the different scales.

Instrument validity was pursued by a panel of experts, but this is still a major concern with this research. I am confused on exactly what was measured. Teachers were asked to indicate "how desirable each of 21 roles was for the success of the Vo-Ag teacher and the total Vo-Ag program." (See Report). That is understandable. Its like asking "how desirable is the role of FFA advisor to success?" But teachers were then asked to respond to two subscales: actual and desired roles. That, in effect, changes the question of "how desirable the role of FFA advisor is to success" to two questions: (1) "How desirable is your actual role of FFA advisor to success?" and (2) "How desirable is your desired role of FFA advisor to success?" I'm not sure that all the respondents interpreted and answered the statements from the same perspective. I'm actually not sure of what was asked. I would also suspect considerable overlap/duplication in the roles presented.

Concerning data analysis, the researchers should be applauded for avoiding a common mistake--that of multiple t-tests which would have caused an inflation of error. To avoid this, the researchers concerned themselves with practical significance, which is also commendable. However, a couple of points should be raised regarding data analysis procedures.

First, the paper reported no tests of statistical significance. Since sample data are used, we don't know if observed scores are representative of the population or if observed differences are statistically significant. Secondly, the Scale of Practical Significant Discrepancies may be useful, but the paper offers no rationale for the levels of significance which are used. A "High" degree of practical signifcance is assigned to mean differences of 1.25 or more. If standard deviations were presented, they might be this large, especially on the converted 13 point scale. In other words, a difference of 1.25 on a scale ranging from 1-13 is not very significant. (See Report).

An identical point must be raised regarding the relationships between teacher characteristics and their role perceptions. A Scale of Practical Significant Relationships was developed (See Report), but a rationale was not presented. Cohen[2] recommends, as a rule of thumb, that an r of .10 or more be judged as a low effect size, an r of .30 or more as a medium effect size, and an r of .50 as a large effect size. It goes without saying then that if differences and relationships are not of practical significance, the conclusions based on these differences and relations are not supported by the data.

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[2] Cohen, Jacob. Statistical Power Analysis For The Behavioral Sciences, N.Y.: Academic Press, 1977, pp. 79-81.

This study investigates an important topic. The researchers obtained an excellent response rate and, to their credit, avoided several common errors. I believe, though, that the research can be strengthened by examining the points raised here.

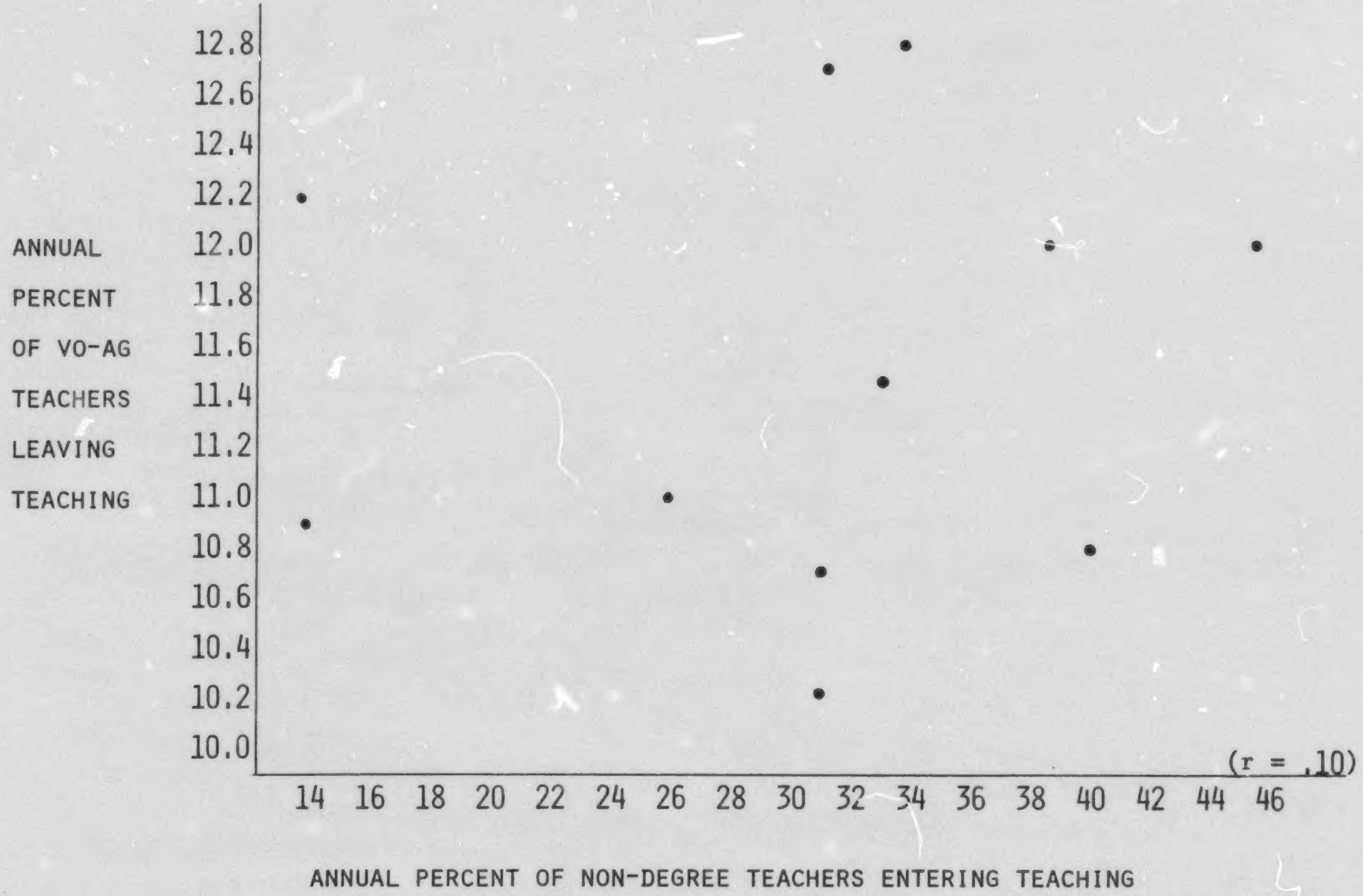

FIGURE 1. SCATTERGRAM OF ANNUAL PERCENT OF NON-DEGREE TEACHERS ENTERING TEACHING AND ANNUAL PERCENT OF TEACHERS LEAVING TEACHING, OHIO, 1970/71-1982/83

OREGON VOCATIONAL AGRICULTURE TEACHER PLACEMENT AND RETENTION FACTORS

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INTRODUCTION

Oregon and the nation have experienced a persistent shortage in the availability of qualified vocational agriculture teachers for the past 25 years. Only recently has the economic down-turn provided any relief for this problem. There have been research studies which sought to identify why teachers left teaching, including Knight and Bender (1979) at Ohio State University and Orlich and Rust (1976) at Washington State University. These studies have shown inadequate salary and long working hours to be consistent major problems; however, their questionnaires did not address the quality of technical agricultural preparation as a potential source of the problem. Osborn (1982) completed research in Ohio which asked teachers to identify their hands-on technical preparation in animal science. Osborn's research did not try to identify potential links between the lack of appropriate technical agriculture preparation and the placement and/or retention of vocational agriculture teachers.

Dr. Miller (1976) found Agricultural Education graduates listed securing more personal freedom and securing a higher salary as major reasons for not entering the teaching profession; however, again, quality of technical preparation was not addressed.

Activities of vocational agriculture teachers have been identified and prioritized by both vocational agriculture teachers and their principals in Iowa (Cole, 1978). This was done to identify vocational agriculture teacher burn-out factors and reduce the number of vocational agriculture teachers leaving teaching. The possibility of inadequate technical agriculture preparation was not specifically considered in that study.

Reilly and Welton (1980) at Kansas State University studied why vocational agriculture teachers stayed in teaching. Again, quality of technical agriculture preparation was not included on the survey questionnaire.

One- and five-year follow-up studies of teaching Agricultural Education graduates at Oregon State University (OSU) indicate very strongly that the quality of technical agriculture preparation was a major concern of practicing vocational agriculture teachers in Oregon (Cole, 1983). Is it also possible that quality of technical agriculture preparation was a contributing factor for the decision not to teach of those agricultural education graduates who have never taught vocational agriculture? And likewise, could quality of technical agriculture preparation have been a major concern leading to the decision to leave teaching for those vocational agriculture teachers who have taught and left?

OBJECTIVES OF THE STUDY

The objectives of the study were as follows:

1) To determine reasons why some Agricultural Education degree recipients choose not to teach vocational agriculture.
2) To determine reasons why some vocational agriculture teachers who enter the teaching profession choose to leave.
3) To determine reasons why some vocational agriculture teachers decide to stay in teaching.
4) To identify where statistically significant differences occur in the opinion of those who never taught, those who taught and left, and those who are still teaching.
5) To determine key criteria which account for the majority of the variation which occurred among the three research groups (those who never taught, those who taught and left, and those who are still teaching).

METHODOLOGY AND PROCEDURE

A computer search was conducted using the Library Information Retrieval Service (LIRS). Relevant literature was identified to gain a perspective of data which was presently available on the questions under study relative to Agricultural Education. Questionnaires were developed which included important criteria for decisions to enter, stay in, or leave the teaching of vocational agriculture from previous research. In addition, questions were included which dealt with the individual's perceptions of the quality of their technical preparation in agriculture, both from a scientific knowledge basis and a hands-on basis. Participants were asked to assess what influence the quality of the technical agriculture preparation had on their decision to not teach, to leave teaching, or to stay in teaching. The questionnaires were submitted to a panel of experts and refinements were made to increase instrument validity and reliability. The instrument was then field tested and final adjustments were made.

The sample selected was all Agricultural Education majors graduating from Oregon State University during the twelve-year period 1971-1982. Only those who graduated and were certified to teach were included in the sample.

A cover letter and questionnaire were mailed to study participants with a follow-up letter and questionnaire mailed three weeks after the originial mailing to non-respondents.

Analysis of data was done using means, frequency counts, single classification analysis of variance (ANOVA), multiple variate analysis (Scheffe's Test), and multiple-discriminant analysis. The alpha level was set at the 0.05 level for rejection of the null hypothesis.

FINDINGS, CONCLUSIONS AND DISCUSSION

Table One shows the number of participants and return rates by group, while Table Two provides information about the gender of the respondents. There were 151 respondents with 40 percent being vocational agriculture teachers still teaching, 35 percent vocational agriculture teachers who started teaching and quit, and 25 percent Agricultural Education majors who never taught vocational agriculture.

Table 1. Sample and Response.

	Number in Group	Response to 1st Mailing	Response to 2nd Mailing	Total Number Responding	Percent Responding
Graduates Who Never Taught	74	25	12	37	50%
Graduates Who Taught and Left Teaching	75	35	18	53	69%
Graduates Who Are Still Teaching	81	43	18	61	75%
Total for Study	230	103	48	151	66%

Table 2. Gender of Respondents.

Gender	Never Taught	Taught & Left	Still Teaching
Female	27%	8%	10%
Male	73%	92%	90%

In 50 percent of the cases, the reason given by females who never taught for not teaching was that there was no vocational agriculture teaching position available within a commute of the spouse's work.

Table Three displays data concerning the graduates' high school and work experience background.

Table 3. High School and Work Experience Background.

Group	4 Years of High School Voc. Ag.	4 Years of FFA	Extremely Active in FFA	4 Years of SOEP	Extremely Active in SOEP	Rural High School	$\bar{x}$ Years of Work Experience in Voc. Ag.	Excellent Quality Work Experience Rating
Never Taught	43%	55%	42%	32%	35%	81%	6	26%
Taught and Left	69%	74%	53%	68%	40%	89%	7	29%
Still Teaching	64%	80%	63%	72%	53%	80%	7	37%

Four years in high school vocational agriculture programs with four years of a Future Farmers of America (FFA) program and four years of Supervised Occupational Experience Program (SOEP) were more important to initial placement and teacher tenure than being from a rural high school.

Table Four presents information concerning preparation for teaching.

Table 4. Preparation for Teaching Generally.

Group	Rural High School for Student Teaching	Very Good-Excellent Quality of Instruction at Student Teaching Center	Very Good-Excellent SOEP at Student Teaching Center	Very Good-Excellent FFA at Student Teaching Center	Institution of Preparation	
					OSU only	OSU & CC
Never Taught	75%	59%	30%	42%	65%	26%
Taught and Left	77%	55%	31%	59%	53%	35%
Still Teaching	61%	55%	35%	62%	51%	39%

Place of teacher preparation (i.e., OSU only versus a combination of OSU and Community College) and a strong FFA chapter at their student teaching center had more impact on retention and/or initial placement of vocational agriculture teachers than did the rural or urban nature of their student teaching center and/or the quality of classroom instruction at their student teaching center.

Note, students who transferred from a community college had a minimum of 70 credits of technical agriculture, much of it hands-on in nature, as compared to the 60 credits of technical agriculture students of the four year Agricultural Education major received at OSU. This may partially explain the reason for greater placement and tenure of Agricultural Education graduates who combined community college education with OSU education. This assumption was supported by one- and five-year follow-up studies (Cole, 1983), of presently teaching Agricultural Education majors. In this study, vocational agriculture teachers recommended the combination of community college and OSU coursework primarily because of the hands-on nature of the community college work.

The median salary for those still teaching vocational agriculture was $20624; for those who taught and left, $20556; and for those who never taught, the median salary was $23332. The salary range for those still teaching vocational agriculture was $15000-$36000; for those who taught and left, $0-125000+; and for those who never taught, $0-125000+.

There were 46 items on the questionnaire dealing with the respondents' perceptions about the job of teaching vocational agriculture and their preparation for that job. Table Five provides information regarding the group response to each of the 46 items.

Each item on the questionnaire had a five-point response scale. The response scale was as follows:

5 = Great Influence to Teach	2 = Some Influence Not to Teach
4 = Some Influence to Teach	1 = Great Influence Not to Teach
3 = No Influence	

Table 5. Job Characteristic and Preparation Response.

	Questionnaire Item	$\bar{x}$ Never Taught	$\bar{x}$ Taught and Left	$\bar{x}$ Still Teaching	F Ratio	F Prob.
1.	In general, the quality of technical agriculture hands-on preparation.	3.18	3.46	3.52	2.045	0.133
2.	In general, the quality of technical agriculture scientific knowledge.	3.43	3.69	3.77	2.032	0.135
3.	Animal science hands-on skills.	3.22	3.42	3.31	0.482	0.619
4.	Animal science scientific knowledge.	3.43	3.70	3.57	1.198	0.305
5.	Crops hands-on skills.	3.00	3.16	2.97	0.441	0.644
6.	Crops scientific knowledge	3.30	3.51	3.16	1.594	0.206
7.	Horticulture hands-on skills.	3.63	3.24	3.35	2.559	0.081
8.	Horticulture scientific knowledge.	3.64	3.40	3.24	2.449	0.090
9.	Soils hands-on skills.	3.21	3.48	3.27	1.102	0.335
10.	Soils scientific knowledge.	3.31	3.80+	3.32	4.417	0.014*
11.	Farm Business Management hands-on skills.	3.42	3.35	3.03	2.254	0.109
12.	Farm Business Management scientific knowledge.	3.53	3.49	3.19	1.969	0.143
13.	Agricultural Mechanics hands-on skills.	3.86	4.06	4.16	1.357	0.260
14.	Agricultural Mechanics scientific knowledge.	3.84	4.00	4.05	0.741	0.478
15.	Preparation in youth leadership.	3.08	3.54	3.63+	4.724	0.010*
16.	Preparation in vocational agriculture program planning and management.	3.28	3.68	4.02+	6.662	0.001*
17.	Preparation in teaching methods.	3.46	3.48	4.03+	5.205	0.006*
18.	Preparation in curriculum development.	3.11+	3.72	4.06	9.059	0.000*
19.	Preparation in classroom control.	2.68	2.80	3.17	3.028	0.052
20.	Student teaching experience.	3.49+	4.34	4.33	7.421	0.000*
21.	High School student interest in vocational agriculture.	3.86	3.28+	4.00	6.135	0.003*
22.	High School student need for control.	2.69	2.68	3.08	2.472	0.088
23.	High School student appreciation of extra effort.	2.92	3.04	3.20	0.691	0.503
24.	High School students' ability to identify goals in agriculture.	3.46	3.21	3.58	2.089	0.127
25.	High School student involvement in other school activities.	3.10	2.87	3.03	0.862	0.425
26.	Availability of vocational agriculture teaching positions in Oregon.	3.32	3.54	3.72	1.342	0.265
27.	My long range occupational objective to teach.	2.86	2.84	3.98+	16.597	0.000*
28.	Prestige of vocational agriculture teachers.	2.64	2.98	3.13	2.569	0.080
29.	Amount of personal freedom teachers allowed.	2.75	2.80	3.44+	5.926	0.003*
30.	Spouse support for teaching vocational agriculture.	2.97	3.00	3.45+	3.705	0.027*
31.	Salary of vocational agriculture teachers.	2.40	2.41	2.84	2.224	0.112
32.	Hours of vocational agriculture teachers.	2.27	2.43	2.57	1.031	0.359
33.	Evening responsibility of vocational agriculture teacher.	2.37	2.41	2.34	0.085	0.919
34.	Job advancement potential of vocational agriculture teachers.	2.67	2.58	2.64	0.064	0.938
35.	Twelve-month contract for vocational agriculture teachers.	3.05	3.48	3.62+	3.602	0.029*
36.	Certification requirements for vocational agriculture teachers.	2.67	2.56	2.78	0.841	0.434
37.	Interpersonal relationships with high school administrators.	2.92	2.61	3.16	2.948	0.056
38.	Facilities for vocational agriculture program.	2.83+	3.34	3.66	6.271	0.002*
39.	Class size in vocational agriculture program.	3.43	3.31	3.59	1.214	0.300
40.	Ability to organize and manage a vocational agriculture program.	3.27	3.48	3.75	2.694	0.071
41.	Opportunity to teach course in areas other than agriculture.	3.19	3.15	3.11	0.106	0.899
42.	Opportunity to spend time with family.	2.36	2.35	2.64	1.211	0.301
43.	Time available for hobbies and interests.	2.29	2.45	2.72	1.880	0.156
44.	Opportunities for inservice on technical agriculture.	3.22	3.31	3.63	2.629	0.076
45.	Opportunities for inservice in program development.	3.05	3.21	3.37	1.693	0.187
46.	Opportunities for inservice in classroom management, learning theories, and methods.	2.94	2.92	3.12	1.053	0.350

*Note: Alpha level = .05, and an asterix was placed at statistically significant F Probabilities. A plus sign (+) was placed by the mean in the group which was statistically significant as compared to one or both of the others.

Mean scores in the technical agriculture preparation block (numbers 1-14) are generally higher for those who taught and left and those still teaching as compared to those who never taught. The only statistically significant difference was between those who taught and left as compared to the other two groups on the subject of soils scientific knowledge.

For agricultural education professional preparation areas (numbers 15-20) those still teaching rated their preparation statistically significantly higher in all but one category, that being classroom control. It appears those who teach vocational agriculture feel better prepared to teach than those who never taught, and those who taught and left.

Personal and professional concerns (numbers 21-46) contained six items of statistical significance. These areas included high school student interest in vocational agriculture, long-range goals of the teacher in teaching, amount of freedom teaching agriculture allowed, spouse support for teaching vocational agriculture, twelve-month contracts, and facilities for vocational agriculture.

Tables Six, Seven, and Eight present data on the ten most important items for each group's decision based on mean scores.

Table 6. Why Agricultural Education Majors Don't Teach Vocational Agriculture.

Rank	Questionnaire Item	Mean Score
1	Hours worked by vocational agriculture teachers.	2.27
2	Time available for hobbies and interests.	2.29
3	Opportunity to spend time with family.	2.36
4	Evening responsibilities of vocational agriculture teacher.	2.37
5	Salary of vocational agriculture teacher.	2.40
6	Prestige of vocational agriculture teacher.	2.64
7	Job advancement potential of vocational agriculture teacher.	2.67
8	Certification requirements for vocational agriculture teacher.	2.67
9	Preparation in classroom control.	2.68
10	High School student need for control.	2.69

Table 7. Why Vocational Agriculture Teachers Leave Teaching.

Rank	Questionnaire Item	Mean Score
1	Opportunity to spend time with family.	2.35
2	Salary of vocational agriculture teacher.	2.41
3	Evening responsibility of vocational agriculture teacher.	2.41
4	Hours worked by vocational agriculture teacher.	2.43
5	Certification requirements for vocational agriculture teacher.	2.56
6	Job advancement potential of vocational agriculture teacher.	2.58
7	Interpersonal relationships with high school administrators.	2.61
8	High school student need for control.	2.68
9	Preparation in classroom control.	2.80
10	Amount of personal freedom teaching allows.	2.80

Table 8. Why Vocational Agriculture Teachers Stay in Teaching.

Rank	Questionnaire Item	Mean Score
1	Student Teaching experience.	4.33
2	Agricultural mechanics hands-on skill.	4.16
3	Preparation in curriculum development.	4.06
4	Agricultural mechanics scientific knowledge.	4.05
5	Preparation in teaching methods.	4.03
6	Preparation in vocational agriculture program planning and management.	4.02
7	High school student interest in vocational agriculture.	4.00
8	Long-range occupational objective to teach.	3.98
9	In general, the quality of technical agriculture scientific knowledge.	3.77
10	Ability to organize and manage a vocational agriculture program.	3.75

Generally, people leave vocational agriculture teaching because of concerns for time, money, and lack of classroom control, whereas, people stay in teaching because of acquisition of technical skill (from whatever source), professional preparation, and the student interest in vocational agriculture.

Multiple discriminant analysis was used to determine which of the 46 items were the most powerful for discriminating placement of variables among the three groups (i.e., never taught, taught and left, and still teaching). The F to enter or remove value was set at the 1.0 level. This procedure allowed for the identification of 20 items. These 20 items produced a prediction formula accuracy of 76 percent and a canonical correlation for function one of 0.7289 which translates to an estimated explained variance of 53 percent. (See Appendices A and B.)

Table Nine presents data from the multiple discriminant analysis in rank order one through twenty.

Table 9. Multiple Discriminant Analysis.

Rank	Questionnaire Item	Wilks Lambda	Significance
1	Long-range occupational objective and commitment to teaching.	0.7936	0.0000
2	Student teaching experience (Professional Preparation).	0.6794	0.0000
3	Student teaching experience (Professional Concerns).	0.6055	0.0000
4	Quality of preparation in program planning and management).	0.5598	0.0000
5	Quality of preparation in scientific knowledge of soils.	0.5256	0.0000
6	Facilities for vocational agriculture programs.	0.4914	0.0000
7	Student involvement in other school activities.	0.4541	0.0000
8	Student interest in vocational agriculture.	0.4257	0.0000
9	Interpersonal relationships with administrators.	0.4040	0.0000
10	Job advancement potential of vocational agriculture teachers.	0.3836	0.0000
11	The amount of personal freedom teaching allowed.	0.3672	0.0000
12	Student appreciation for extra effort required to teach vocational agriculture.	0.3516	0.0000
13	Twelve-month contracts for vocational agriculture teachers.	0.3386	0.0000
14	Quality of preparation in teaching methods.	0.3264	0.0000
15	Opportunity to teach courses other than agriculture.	0.3157	0.0000
16	Evening responsibilities of vocational agriculture teachers.	0.3061	0.0000
17	Hours worked as a vocational agriculture teacher.	0.2985	0.0000
	(continued)		

Table 9. Multiple Discrimanant Analysis Continued.

Rank	Questionnaire Item	Wilks Lambda	Significance
18	Quality of preparation in hands-on Animal Science skills.	0.2923	0.0000
19	Quality of preparation in hands-on Horticulture skills.	0.2848	0.0000
20	Quality of preparation in technical agriculture scientific knowledge, generally.	0.2786	0.0000

The quality of the student teaching experience, the quality of professional (pedagogical) and technical hands-on preparation and specific attitudinal adjustment appear to be the major areas that teacher educators can impact to improve vocational agriculture teacher placement and retention.

An open-ended question was asked at the end of the questionnaire. The question sought information regarding the most important reason in favor of teaching and the most important reason in opposition to teaching. Fifty-four percent of the respondents still teaching combined "enjoyed students" and "like teaching" as the primary reasons for staying in teaching. Forty percent of the respondents who left teaching combined "inadequate salary", "long hours worked", and "wanted to get into production agriculture" as major reasons for leaving teaching. Thirty-eight percent of the respondents who never taught combined "job opportunities in production agriculture", "job opportunities in agri-business", and "low salary for teachers" as major reasons for not entering teaching.

RECOMMENDATIONS AND IMPLICATIONS

Major recommendations and implications of this study include the following. Students who have been actively involved in a total program of vocational agriculture, with special attention to the SOEP and FFA involvement, should be recruited as Agricultural Education majors.

Student teaching centers should not only have good teachers, but active SOEPs and FFA chapters as well.

Students who go to a community college to get hands-on preparation in technical agriculture should be recruited into the teaching preparation.

Increases in the quality of coursework in technical agriculture for both hands-on skills and scientific knowledge should be made to increase initial teacher placement and improve retention of vocational agriculture teachers.

Pedagogy in Agricultural Education is extremely important to the longevity of vocational agriculture teachers. Given the difference in mean scores reported by the groups for the same courses taken, it appears some take their pedagogy courses much more seriously than others. It is therefore recommended to make these courses as "real world" as possible, and to seriously counsel with those students who appear not to be taking the course requirements and assignments seriously (using data provided in this study).

Long range occupational objective forecasts appear important to determining an Agricultural Education major's final occupational destination. Occupational objectives for Agricultural Education majors should be identified early and appropriate counseling should follow.

Spouse support, low salary, long hours, time for hobbies and recreation concerns of respondents in this study remain consistant with identified concerns of respondents to other follow-up studies in Oregon and other states. Efforts should be made programmatically to reduce those concerns.

Standard Certification requirements should be reviewed and adjusted considering the very low mean score given this factor by all three groups.

The preservice program must address interpersonal relationships with administrators and how to build student interest in vocational agriculture courses and activities, expecially when SOEP and FFA activities are in competition with other school activities.

Follow-up studies should be conducted periodically to assess the value of Agricultural Education program changes and to determine Agricultural Education program direction.

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APPENDIX A

Classification Results (Predictive Accuracy)

Actual Group	No. of Cases	Predicted Group Membership		
		1	2	3
Group 1	53	40* 75.5	5 9.4	8 15.1
Group 2	44	5 11.4	34 77.3	5 11.4
Group 3	33	6 18.2	2 6.2	25 75.8

Percent of Grouped Cases Correctly Classified = 76.15

*Note: Predicted Group Membership Statistics are presented as $\frac{\text{number}}{\text{percent}}$.

APPENDIX B

Canonical Discriminant Functions

Function	Eigen-value	Relative Percent	Canonical Correlation	After Function	Wilks Lambda	Chi-Squared	D.F.	Signif.
1	1.1337	62.44	0.7289	0	0.2786	136.09	40	0.0000
2	0.6821	37.56	0.6368	1	0.5945	55.38	19	0.0000

TRENDS IN THE PREPARATION, DEMAND AND MOBILITY OF SECONDARY VOCATIONAL AGRICULTURE TEACHERS IN OHIO, 1970-1983

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INTRODUCTION

Since the enactment of the Vocational Education Act of 1963 and its subsequent amendments, vocational agriculture programs at the secondary level in Ohio have expanded in number and instructional areas. From a program in production agriculture with approximately 250 local vocational agriculture teachers in the early 1960's, the program grew to over [illegible]0 secondary teachers in the following instructional areas: Production Agriculture, Agribusiness, Agricultural Mechanics, Animal Care, Products Processing, Horticulture, Natural Resources, Environmental Management and Forestry. This unprecedented growth brought a demand for vocational agriculture teachers that far exceeded the supply from the undergraduate teacher education program. Teacher preparation programs, under changes in state teacher certification standards, turned to alternate programs to help meet the demand in a short period of time.

In addition to the demand for many more vocational agriculture teachers, the expanded instructional areas with specific certification requirements demanded a new approach to teacher preparation. Courses and programs were not available within the University to meet the technical agriculture requirements for certification in such areas as small animal care, products processing or environmental management. Recruiting persons from business and industry who possessed the required technical competence became the adopted alternative with professional education preparation provided over a two-year period.

Recently, growth and expansion of vocational agriculture in Ohio has ceased. Nearly every school district has established vocational programs to meet state mandates, and the number of available students is declining. These changes have prompted several questions regarding continued trends in the need for and preparation of teachers. Answers regarding the research questions will be beneficial in predicting the demand for secondary teachers of vocational agriculture and the type of preparation those teachers will require.

OBJECTIVES

The purpose of this study was to describe the trends in the preparation, demand and mobility of secondary vocational agriculture teachers in Ohio during the period 1970-71 through 1982-83. The study included the following research questions:

1. What are the trends in the number of positions in teaching vocational agriculture at the secondary level?

2. What are the trends in the type of preparation of these teachers?

3. What are the trends in the demand for these teachers?

4. What are the trends in the number of teachers leaving the profession and the occupations they enter upon leaving teaching?

RELATED LITERATURE

The shortage of vocational agriculture teachers in the United States brought about changes in the preparation of teachers to meet the demand. Expansion of vocational agriculture into a number of specialized program areas also spawned changes in demand and preparation of teachers. As early as 1953, studies were conducted to help identify why teachers enter or leave the profession. Several studies have investigated the supply and demand of teachers of vocational agriculture. Most notable is the annual study that has been conducted by Woodin and later by Craig that details the annual demand for vocational agriculture teachers and how well the demand was met in each state. The Woodin and Craig studies have shown for several years that the demand has exceeded the supply of teachers. However, no attempt has been made to identify the type of preparation of the teachers who fill the positions or the factors that created the demand.

Bender and others have completed periodic follow-up studies of agricultural education graduates. Although such studies provide interesting data regarding agricultural education college graduates, no specific follow-up of those who enter teaching has been conducted. Further, because of the certification procedures implemented in Ohio in the early 1970's, some teachers are not college graduates and, therefore, would not be included in the study. Thomas, et al. (1974), found no identifiable trend in the mobility of teachers within the profession or in leaving the profession.

Morgan (1978) studied the factors that created demand for local agricultural education personnel from 1970-71 through 1976-77. He found that death, retirement, employment in other occupations and growth in the number of positions were the main factors creating demand for personnel in Ohio. Further, Morgan found that the preparation of agricultural education personnel changed over the course of the years studied. The data indicated that an increasing number of personnel with no formal undergraduate teacher education program who possess less than a bachelor's degree were being employed in Ohio.

This study served as an extension and expansion of Morgan's 1978 study which addressed teacher mobility in agricultural education in Ohio. An additional six years of data have been added, and a shift in trends has been identified.

METHODOLOGY

The study is descriptive in nature. Data were collected annually in the fall of each year from 1970 through 1982. The population for the study was all high school teachers of vocational agriculture in Ohio at the time of data collection each year (September-October). The accumulated data for the 13 years of the study include 1505 different persons who were high school teachers of vocational agriculture for at least one year of the 13 in the study. The entire population is included in the study.

The instrument used was designed to collect information regarding the current status of each person in the study. Information included type of preparation, current position and school, instructional area and job entered upon leaving the profession. The list of personnel included in the study was obtained from the "Ohio Vocational Agriculture Directory."

FINDINGS

Trends in Number of Positions

The number of secondary vocational agriculture teachers in Ohio increased steadily from 465 in 1970-71 to a high of 764 in 1979-80, then decreased to 698 in 1982-83 (see Table 1).

The number of teachers employed by local school districts reached a high of 420 in 1972-73 and has declined since then to a total of 352. The number employed by area vocational schools increased from 61 in 1970-71 to 313 in 1979-80 before falling to 290 in 1982-83. The number of teachers employed by large city schools went from 15 in 1970-71 to 63 in 1977-78 and then declined to 56 in 1982-83. The percent of teachers in local schools has decreased steadily while the percent of teachers in area and city schools has increased (see Table 1).

Trends in the Type of Preparation of Teachers

The number of teachers entering or reentering the profession grew from 77 in 1971-72 to 130 in 1976-77, then declined to 53 in 1982-83. Of the total teachers entering the profession in 1971-72, 76.6% held a B.S. degree in agriculture and were professionally prepared as a teacher of vocational agriculture prior to entering the profession. The percent decreased from 37.7 in 1976-77, then increased to stabilize at approximately 54% from 1977-78 to 1982-83 (see Table 2).

In 1971-72, 16.9% of the teachers entering and re-entering the profession in Ohio did not hold a B.S. degree in agriculture and were not professionally prepared as a teacher of vocational agriculture prior to entering the profession. The percent increased to 45.4 in 1976-77, then stabilized around 35% over the next six years. The percent of entering and re-entering teachers who held a B.S. degree in agriculture but were not professionally prepared as a teacher of vocational agriculture prior to entering or re-entering teaching fluctuated from year to year, varying from 6.5% in 1971-72 to 7.5% in 1982-83. This included a high of 22% in 1972-73 and a low of 5.0% in 1973-74 (see Table 2).

Trends in the Demand for Secondary Teachers of Vocational Agriculture

From 1971-72, the demand for entering vocational agriculture teachers was created by four factors: an increase in the number of positions, death, retirement and personnel leaving the profession the previous year. The number of positions to be filled due to death and retirement remained relatively stable throughout the 13 years of the study. Demand for teachers due to a change in the number of positions increased from 29 in 1971-72 to 58 in 1976-77, then declined to 5 in 1979-80. Since 1980-81, there has been a decrease in the total number of positions in agricultural education at the local level in Ohio. The demand for teachers due to persons leaving teaching the previous year for reasons other than death and retirement increased from 43 in 1971-72 to 86 in 1979-80, then decreased to 66 in 1982-83 (see Table 3).

Trends in the Number Leaving Teaching and the Occupations they Enter

The number of secondary vocational agriculture teachers leaving the profession increased from 48 at the end of 1970-71 to 96 at the end of 1977-78 and 1978-79, then declined to 77 at the end of 1981-82. The percent of the total population leaving annually varied from 10.3% in 1970-71 to 12.8% in 1977-78, then to 10.7% in 1981-82 (see Table 4).

Of those who entered teaching in 1970-71, 18.2% left at the end of the first year. The percent of entering personnel who left after one year increased to 24.5% in 1981-82. The percent of entering personnel who left teaching at the end of subsequent years declined dramatically. For most years in the study, approximately 50% of the entering teaching had left the profession after six years. The percent of the original entering group that leaves annually after six years in teaching is approximately 3% (see Table 5).

For the 13-year period, the occupation entered most frequently upon leaving teaching was business and industry with 38% of those who left the profession. Another 21% entered farming, and 13% retired from the profession or were deceased. The remaining 28% were distributed over a wide variety of areas (see Table 6).

IMPLICATIONS OF THE STUDY

Several implications arise from an analysis of the findings. The trend toward a decreasing number of teaching positions and a decreasing number of teachers entering annually should cause teacher education to monitor closely the number of graduates seeking positions in secondary agricultural education to avoid an over supply of traditionally prepared teachers. A number of options should be explored. One solution may be to limit through some type of screening the number of persons entering teacher preparation programs. Another approach may be to inform students about the projected demand and supply and let the students decide whether or not to continue in a teacher preparation program.

Recent enrollment declines at the university level may offset the decreased demand for teachers. The need for teachers who hold no B.S. degree and are not prepared professionally should continue to decline. An effort should be made to determine the value of continuing these special preparation programs; they may not be needed. Since demand for personnel has stabilized around 11% of the population annually and there is no longer an increase in the number of positions, it should be possible to estimate more accurately persons needed in the profession.

The destinations of teachers who leave the profession have not changed appreciably over the years. Further analysis of the data regarding what types of personnel leave, such as their preparation or their instructional area, should be conducted. These factors may assist in predicting mobility of and demand for vocational agriculture teachers in secondary schools.

Finally, there appears to be a relationship between the annual percent of teachers leaving the profession and the percent of entering teachers who have no B.S. degree and are not professionally prepared as a teacher of vocational agriculture. Further analysis of this suspected relationship is needed. Such a relationship would have implications for expected teacher turnover and, therefore, projected demand for secondary vocational agriculture teachers.

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Table 1

Secondary Vocational Agriculture Teachers

in Ohio, 1970-71 to 1982-83

Year	Type of School								Total	
	Local		Area Vocational		City		Other			
	f	%	f	%	f	%	f	%	f	%
1970-71	388	83.5	61	13.1	15	3.2	1	0.2	465	100.0
1971-72	397	80.3	82	16.6	14	2.8	1	0.3	494	100.0
1972-73	420	76.5	111	20.2	18	3.3	0	-	549	100.0
1973-74	409	70.1	149	25.6	24	4.1	1	0.2	583	100.0
1974-75	410	66.2	170	27.4	39	6.3	1	0.1	620	100.0
1975-76	408	61.1	216	32.4	43	6.4	1	0.1	668	100.0
1976-77	394	54.3	271	37.3	59	8.1	2	0.3	726	100.0
1977-78	419	55.7	270	35.9	63	8.4	0	-	752	100.0
1978-79	410	54.1	289	38.2	58	7.7	0	-	757	100.0
1979-80	389	50.8	313	41.0	57	7.5	5	0.7	764	100.0
1980-81	367	49.6	310	41.8	63	8.5	2	0.1	742	100.0
1981-82	358	49.7	305	42.2	58	8.0	1	0.1	722	100.0
1982-83	352	50.5	290	41.5	56	8.0	0	-	698	100.0

Table 2

Type of Preparation of Entering and Re-entering Secondary Vocational Agriculture Teachers, 1970-71 to 1982-83

	Type of Preparation							
Year Entering	Degree in Ag Teacher Ed Program		Degree in Ag No Teacher Ed Program		No BS in Ag No Teacher Ed Program		Total	
	f	%	f	%	f	%	f	%
1971-72	59	76.6	5	6.5	13	16.9	77	100.0
1972-73	69	63.3	24	22.0	16	14.7	109	100.0
1973-74	63	62.3	5	5.0	33	32.7	101	100.0
1974-75	57	54.8	14	13.5	33	31.7	104	100.0
1975-76	45	40.6	19	17.1	47	42.3	111	100.0
1976-77	49	37.7	22	16.9	59	45.4	130	100.0
1977-78	59	52.2	16	14.2	38	33.6	113	100.0
1978-79	57	56.4	12	11.9	32	31.7	101	100.0
1979-80	52	51.5	10	9.9	39	38.6	101	100.0
1980-81	39	52.7	15	20.3	20	27.0	74	100.0
1981-82	33	61.1	4	7.4	17	31.5	54	100.0
1982-83	28	52.9	4	7.5	21	39.6	53	100.0

Table 3

Factors Creating Demand for Entering Secondary Vocational Agriculture Teachers, 1971-72 to 1892-83

	Demand Factors									
	Change in No. of in Ag Ed		Death Year		Retirement Year		Left for Other Employment Year		Total Demand	
Year Entering	f	%	f	%	f	%	f	%	f	%
1971-72	29	37.7	0	-	5	6.5	43	55.8	77	100.0
1972-73	55	50.4	2	1.8	9	8.3	43	39.5	109	100.0
1973-74	34	33.7	1	1.0	7	6.9	59	58.4	101	100.0
1974-75	37	35.6	0	-	6	5.8	61	58.6	104	100.0
1975-76	48	43.2	1	0.9	9	8.1	53	47.8	111	100.0
1976-77	58	44.6	3	2.3	10	7.7	59	45.4	130	100.0
1977-78	26	23.0	2	1.8	6	5.3	79	69.9	113	100.0
1978-79	5	5.0	2	2.0	11	10.9	83	82.1	101	100.0
1979-80	5	5.0	1	1.0	9	8.9	86	85.1	101	100.0
1980-81	-18	-	1	-	11	-	80	-	74	-
1981-82	-20	-	2	-	7	-	65	-	54	-
1982-83	-24	-	0	-	11	-	66	-	53	-

Table 4

Total Secondary Vocational Agriculture Teachers Leaving Teaching, 1970-71 to 1981-82

Year	Total Teachers in Profession	Number Leaving the Profession	
	f	f	%
1970-71	465	48	10.3
1971-72	494	54	10.9
1972-73	549	67	12.2
1973-74	583	67	11.5
1974-75	620	63	10.2
1975-76	668	72	10.8
1976-77	726	87	12.0
1977-78	752	96	12.8
1978-79	757	96	12.7
1979-80	764	92	12.0
1980-81	742	74	10.0
1981-82	722	77	10.7

Table 5

Secondary Vocational Agriculture Teachers Entering, Re-Entering and Leaving Teaching, 1971-72 to 1981-82

Year Entering	No. of Entering Teachers	Teachers Leaving at End of[a]																								Still Teaching 1981-82	
		1970-71		1971-72		1972-73		1973-74		1974-75		1975-76		1976-77		1977-78		1978-79		1979-80		1980-81		1981-82			
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1970-71	77	14	18.2	8	10.4	8	10.4	9	11.7	3	3.9	3	3.9	3	3.9	3	3.9	2	2.6	1	1.3	1	1.3	0	-	34	44.2
1971-72	77			12	15.6	7	9.1	2	2.6	4	5.2	6	7.8	5	6.5	3	3.9	3	3.9	3	3.9	3	3.9	3	3.9	34	44.2
1972-73	109					13	11.9	20	18.3	4	3.7	7	6.4	8	7.3	6	5.5	5	4.6	4	3.7	3	2.8	3	2.8	47	43.1
1973-74	101							19	18.8	11	10.9	8	7.9	7	6.9	7	6.9	2	2.0	7	6.9	3	3.0	1	1.0	39	38.6
1974-75	104									18	17.3	13	12.5	10	9.6	4	3.8	7	6.7	6	5.8	3	2.9	2	1.9	50	48.1
1975-76	111											17	15.3	16	14.4	9	8.1	11	9.9	9	8.1	3	2.7	5	4.5	44	39.6
1976-77	130													20	15.4	20	15.4	16	12.3	9	6.9	8	6.2	3	2.3	66	50.8
1977-78	113															25	22.1	19	16.8	5	4.4	5	4.4	11	9.7	52	46.0
1978-79	101																	22	21.8	19	18.8	11	10.9	10	9.9	44	43.6
1979-80	101																			21	20.8	16	15.8	9	8.9	57	56.4
1980-81	74																					15	20.3	12	16.2	47	63.5
1981-82	53																							13	24.5	40	75.5

[a] Totals by year may not equal number of entering teachers as a result of some teachers re-entering the profession.

Table 6

Occupations Entered by Secondary Vocational Agriculture Teachers Leaving Teaching, 1971-1983

Year Left	Occupation Entered Upon Leaving Teaching											
	Other School Employment		Farming		Business or Industry		Retirement or Death		Other		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1970-71	10	20.8	12	25.0	14	29.2	5	10.4	7	14.6	48	100.0
1971-72	11	20.4	12	22.1	17	31.5	11	20.4	3	5.6	54	100.0
1972-73	11	16.4	15	22.4	27	40.3	8	11.9	6	9.0	67	100.0
1973-74	14	20.9	9	13.4	29	43.3	6	9.0	9	13.4	67	100.0
1974-75	15	23.8	11	17.5	20	31.7	10	15.9	7	11.1	63	100.0
1975-76	9	12.5	14	19.4	32	44.4	13	18.1	4	5.6	72	100.0
1976-77	14	16.1	22	25.3	35	40.2	8	9.2	8	9.2	87	100.0
1977-78	10	10.4	15	15.6	49	51.1	13	13.5	9	9.4	96	100.0
1978-79	13	13.5	31	32.3	29	30.3	10	10.4	13	13.5	96	100.0
1979-80	16	17.4	18	19.6	24	26.1	12	13.0	22	23.9	92	100.0
1980-81	10	13.5	17	23.0	29	39.1	9	12.2	9	12.2	74	100.0
1981-82	7	9.1	10	13.0	37	48.0	11	14.3	12	15.6	77	100.0
Totals	140	15.7	186	20.8	342	38.3	116	13.0	109	12.2	893	100.0

TRENDS IN THE PREPARATION, DEMAND AND MOBILITY OF SECONDARY VOCATIONAL AGRICULTURE TEACHERS IN OHIO, 1970-1983

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INTRODUCTION

Since the enactment of the Vocational Education Act of 1963 and its subsequent amendments, vocational agriculture programs at the secondary level in Ohio have expanded in number and instructional areas. From a program in production agriculture with approximately 250 local vocational agriculture teachers in the early 1960's, the program grew to over 700 secondary teachers in the following instructional areas: Production Agriculture, Agribusiness, Agricultural Mechanics, Animal Care, Products Processing, Horticulture, Natural Resources, Environmental Management and Forestry. This unprecedented growth brought a demand for vocational agriculture teachers that far exceeded the supply from the undergraduate teacher education program. Teacher preparation programs, under changes in state teacher certification standards, turned to alternate programs to help meet the demand in a short period of time.

In addition to the demand for many more vocational agriculture teachers, the expanded instructional areas with specific certification requirements demanded a new approach to teacher preparation. Courses and programs were not available within the University to meet the technical agriculture requirements for certification in such areas as small animal care, products processing or environmental management. Recruiting persons from business and industry who possessed the required technical competence became the adopted alternative with professional education preparation provided over a two-year period.

Recently, growth and expansion of vocational agriculture in Ohio has ceased. Nearly every school district has established vocational programs to meet state mandates, and the number of available students is declining. These changes have prompted several questions regarding continued trends in the need for and preparation of teachers. Answers regarding the research questions will be beneficial in predicting the demand for secondary teachers of vocational agriculture and the type of preparation those teachers will require.

OBJECTIVES

The purpose of this study was to describe the trends in the preparation, demand and mobility of secondary vocational agriculture teachers in Ohio during the period 1970-71 through 1982-83. The study included the following research questions:

1. What are the trends in the number of positions in teaching vocational agriculture at the secondary level?

2. What are the trends in the type of preparation of these teachers?

3. What are the trends in the demand for these teachers?

4. What are the trends in the number of teachers leaving the profession and the occupations they enter upon leaving teaching?

RELATED LITERATURE

The shortage of vocational agriculture teachers in the United States brought about changes in the preparation of teachers to meet the demand. Expansion of vocational agriculture into a number of specialized program areas also spawned changes in demand and preparation of teachers. As early as 1953, studies were conducted to help identify why teachers enter or leave the profession. Several studies have investigated the supply and demand of teachers of vocational agriculture. Most notable is the annual study that has been conducted by Woodin and later by Craig that details the annual demand for vocational agriculture teachers and how well the demand was met in each state. The Woodin and Craig studies have shown for several years that the demand has exceeded the supply of teachers. However, no attempt has been made to identify the type of preparation of the teachers who fill the positions or the factors that created the demand.

Bender and others have completed periodic follow-up studies of agricultural education graduates. Although such studies provide interesting data regarding agricultural education college graduates, no specific follow-up of those who enter teaching has been conducted. Further, because of the certification procedures implemented in Ohio in the early 1970's, some teachers are not college graduates and, therefore, would not be included in the study. Thomas, et al. (1974), found no identifiable trend in the mobility of teachers within the profession or in leaving the profession.

Morgan (1978) studied the factors that created demand for local agricultural education personnel from 1970-71 through 1976-77. He found that death, retirement, employment in other occupations and growth in the number of positions were the main factors creating demand for personnel in Ohio. Further, Morgan found that the preparation of agricultural education personnel changed over the course of the years studied. The data indicated that an increasing number of personnel with no formal undergraduate teacher education program who possess less than a bachelor's degree were being employed in Ohio.

This study served as an extension and expansion of Morgan's 1978 study which addressed teacher mobility in agricultural education in Ohio. An additional six years of data have been added, and a shift in trends has been identified.

METHODOLOGY

The study is descriptive in nature. Data were collected annually in the fall of each year from 1970 through 1982. The population for the study was all high school teachers of vocational agriculture in Ohio at the time of data collection each year (September-October). The accumulated data for the 13 years of the study include 1505 different persons who were high school teachers of vocational agriculture for at least one year of the 13 in the study. The entire population is included in the study.

The instrument used was designed to collect information regarding the current status of each person in the study. Information included type of preparation, current position and school, instructional area and job entered upon leaving the profession. The list of personnel included in the study was obtained from the "Ohio Vocational Agriculture Directory."

FINDINGS

Trends in Number of Positions

The number of secondary vocational agriculture teachers in Ohio increased steadily from 465 in 1970-71 to a high of 764 in 1979-80, then decreased to 698 in 1982-83 (see Table 1).

The number of teachers employed by local school districts reached a high of 420 in 1972-73 and has declined since then to a total of 352. The number employed by area vocational schools increased from 61 in 1970-71 to 313 in 1979-80 before falling to 290 in 1982-83. The number of teachers employed by large city schools went from 15 in 1970-71 to 63 in 1977-78 and then declined to 56 in 1982-83. The percent of teachers in local schools has decreased steadily while the percent of teachers in area and city schools has increased (see Table 1).

Trends in the Type of Preparation of Teachers

The number of teachers entering or reentering the profession grew from 77 in 1971-72 to 130 in 1976-77, then declined to 53 in 1982-83. Of the total teachers entering the profession in 1971-72, 76.6% held a B.S. degree in agriculture and were professionally prepared as a teacher of vocational agriculture prior to entering the profession. The percent decreased from 37.7 in 1976-77, then increased to stabilize at approximately 54% from 1977-78 to 1982-83 (see Table 2).

In 1971-72, 16.9% of the teachers entering and re-entering the profession in Ohio did not hold a B.S. degree in agriculture and were not professionally prepared as a teacher of vocational agriculture prior to entering the profession. The percent increased to 45.4 in 1976-77, then stabilized around 35% over the next six years. The percent of entering and re-entering teachers who held a B.S. degree in agriculture but were not professionally prepared as a teacher of vocational agriculture prior to entering or re-entering teaching fluctuated from year to year, varying from 6.5% in 1971-72 to 7.5% in 1982-83. This included a high of 22% in 1972-73 and a low of 5.0% in 1973-74 (see Table 2).

Trends in the Demand for Secondary Teachers of Vocational Agriculture

From 1971-72, the demand for entering vocational agriculture teachers was created by four factors: an increase in the number of positions, death, retirement and personnel leaving the profession the previous year. The number of positions to be filled due to death and retirement remained relatively stable throughout the 13 years of the study. Demand for teachers due to a change in the number of positions increased from 29 in 1971-72 to 58 in 1976-77, then declined to 5 in 1979-80. Since 1980-81, there has been a decrease in the total number of positions in agricultural education at the local level in Ohio. The demand for teachers due to persons leaving teaching the previous year for reasons other than death and retirement increased from 43 in 1971-72 to 86 in 1979-80, then decreased to 66 in 1982-83 (see Table 3).

Trends in the Number Leaving Teaching and the Occupations they Enter

The number of secondary vocational agriculture teachers leaving the profession increased from 48 at the end of 1970-71 to 96 at the end of 1977-78 and 1978-79, then declined to 77 at the end of 1981-82. The percent of the total population leaving annually varied from 10.3% in 1970-71 to 12.8% in 1977-78, then to 10.7% in 1981-82 (see Table 4).

Of those who entered teaching in 1970-71, 18.2% left at the end of the first year. The percent of entering personnel who left after one year increased to 24.5% in 1981-82. The percent of entering personnel who left teaching at the end of subsequent years declined dramatically. For most years in the study, approximately 50% of the entering teaching had left the profession after six years. The percent of the original entering group that leaves annually after six years in teaching is approximately 3% (see Table 5).

For the 13-year period, the occupation entered most frequently upon leaving teaching was business and industry with 38% of those who left the profession. Another 21% entered farming, and 13% retired from the profession or were deceased. The remaining 28% were distributed over a wide variety of areas (see Table 6).

IMPLICATIONS OF THE STUDY

Several implications arise from an analysis of the findings. The trend toward a decreasing number of teaching positions and a decreasing number of teachers entering annually should cause teacher education to monitor closely the number of graduates seeking positions in secondary agricultural education to avoid an over supply of traditionally prepared teachers. A number of options should be explored. One solution may be to limit through some type of screening the number of persons entering teacher preparation programs. Another approach may be to inform students about the projected demand and supply and let the students decide whether or not to continue in a teacher preparation program.

Recent enrollment declines at the university level may offset the decreased demand for teachers. The need for teachers who hold no B.S. degree and are not prepared professionally should continue to decline. An effort should be made to determine the value of continuing these special preparation programs; they may not be needed. Since demand for personnel has stabilized around 11% of the population annually and there is no longer an increase in the number of positions, it should be possible to estimate more accurately persons needed in the profession.

The destinations of teachers who leave the profession have not changed appreciably over the years. Further analysis of the data regarding what types of personnel leave, such as their preparation or their instructional area, should be conducted. These factors may assist in predicting mobility of and demand for vocational agriculture teachers in secondary schools.

Finally, there appears to be a relationship between the annual percent of teachers leaving the profession and the percent of entering teachers who have no B.S. degree and are not professionally prepared as a teacher of vocational agriculture. Further analysis of this suspected relationship is needed. Such a relationship would have implications for expected teacher turnover and, therefore, projected demand for secondary vocational agriculture teachers.

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Table 1

Secondary Vocational Agriculture Teachers in Ohio, 1970-71 to 1982-83

	Type of School									
	Local		Area Vocational		City		Other		Total	
Year	f	%	f	%	f	%	f	%	f	%
1970-71	388	83.5	61	13.1	15	3.2	1	0.2	465	100.0
1971-72	397	80.3	82	16.6	14	2.8	1	0.3	494	100.0
1972-73	420	76.5	111	20.2	18	3.3	0	-	549	100.0
1973-74	409	70.1	149	25.6	24	4.1	1	0.2	583	100.0
1974-75	410	66.2	170	27.4	39	6.3	1	0.1	620	100.0
1975-76	408	61.1	216	32.4	43	6.4	1	0.1	668	100.0
1976-77	394	54.3	271	37.3	59	8.1	2	0.3	726	100.0
1977-78	419	55.7	270	35.9	63	8.4	0	-	752	100.0
1978-79	410	54.1	289	38.2	58	7.7	0	-	757	100.0
1979-80	389	50.8	313	41.0	57	7.5	5	0.7	764	100.0
1980-81	367	49.6	310	41.8	63	8.5	2	0.1	742	100.0
1981-82	358	49.7	305	42.2	58	8.0	1	0.1	722	100.0
1982-83	352	50.5	290	41.5	56	8.0	0	-	698	100.0

Table 2

Type of Preparation of Entering and Re-entering Secondary Vocational Agriculture Teachers, 1970-71 to 1982-83

Year Entering	Type of Preparation						Total	
	Degree in Ag Teacher Ed Program		Degree in Ag No Teacher Ed Program		No BS in Ag No Teacher Ed Program			
	f	%	f	%	f	%	f	%
1971-72	59	76.6	5	6.5	13	16.9	77	100.0
1972-73	69	63.3	24	22.0	16	14.7	109	100.0
1973-74	63	62.3	5	5.0	33	32.7	101	100.0
1974-75	57	54.8	14	13.5	33	31.7	104	100.0
1975-76	45	40.6	19	17.1	47	42.3	111	100.0
1976-77	49	37.7	22	16.9	59	45.4	130	100.0
1977-78	59	52.2	16	14.2	38	33.6	113	100.0
1978-79	57	56.4	12	11.9	32	31.7	101	100.0
1979-80	52	51.5	10	9.9	39	38.6	101	100.0
1980-81	39	52.7	15	20.3	20	27.0	74	100.0
1981-82	33	61.1	4	7.4	17	31.5	54	100.0
1982-83	28	52.9	4	7.5	21	39.6	53	100.0

Table 3

Factors Creating Demand for Entering Secondary Vocational Agriculture Teachers, 1971-72 to 1892-83

	Demand Factors									
Year Entering	Change in No. of in Ag Ed		Death Year		Retirement Year		Left for Other Employment Year		Total Demand	
	f	%	f	%	f	%	f	%	f	%
1971-72	29	37.7	0	-	5	6.5	43	55.8	77	100.0
1972-73	55	50.4	2	1.8	9	8.3	43	39.5	109	100.0
1973-74	34	33.7	1	1.0	7	6.9	59	58.4	101	100.0
1974-75	37	35.6	0	-	6	5.8	61	58.6	104	100.0
1975-76	48	43.2	1	0.9	9	8.1	53	47.8	111	100.0
1976-77	58	44.6	3	2.3	10	7.7	59	45.4	130	100.0
1977-78	26	23.0	2	1.8	6	5.3	79	69.9	113	100.0
1978-79	5	5.0	2	2.0	11	10.9	83	82.1	101	100.0
1979-80	5	5.0	1	1.0	9	8.9	86	85.1	101	100.0
1980-81	-18	-	1	-	11	-	80	-	74	-
1981-82	-20	-	2	-	7	-	65	-	54	-
1982-83	-24	-	0	-	11	-	66	-	53	-

Table 4

Total Secondary Vocational Agriculture Teachers

Leaving Teaching, 1970-71 to 1981-82

Year	Total Teachers in Profession	Number Leaving the Profession	
	f	f	%
1970-71	465	48	10.3
1971-72	494	54	10.9
1972-73	549	67	12.2
1973-74	583	67	11.5
1974-75	620	63	10.2
1975-76	668	72	10.8
1976-77	726	87	12.0
1977-78	752	96	12.8
1978-79	757	96	12.7
1979-80	764	92	12.0
1980-81	742	74	10.0
1981-82	722	77	10.7

Table 5

Secondary Vocational Agriculture Teachers Entering, Re-Entering and Leaving Teaching, 1971-72 to 1981-82

Year Entering	No. of Entering Teachers	Teachers Leaving at End of[a]																								Still Teaching 1981-82	
		1970-71		1971-72		1972-73		1973-74		1974-75		1975-76		1976-77		1977-78		1978-79		1979-80		1980-81		1981-82			
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1970-71	77	14	18.2	8	10.4	8	10.4	9	11.7	3	3.9	3	3.9	3	3.9	3	3.9	2	2.6	1	1.3	1	1.3	0	-	34	44.2
1971-72	77			12	15.6	7	9.1	2	2.6	4	5.2	6	7.8	5	6.5	3	3.9	3	3.9	3	3.9	3	3.9	3	3.9	34	44.2
1972-73	109					13	11.9	20	18.3	4	3.7	7	6.4	8	7.3	6	5.5	5	4.6	4	3.7	3	2.8	3	2.8	47	43.1
1973-74	101							19	18.8	11	10.9	8	7.9	7	6.9	7	6.9	2	2.0	7	6.9	3	3.0	1	1.0	39	38.6
1974-75	104									18	17.3	13	12.5	10	9.6	4	3.8	7	6.7	6	5.8	3	2.9	2	1.9	50	48.1
1975-76	111											17	15.3	16	14.4	9	8.1	11	9.9	9	8.1	3	2.7	5	4.5	44	39.6
1976-77	130													20	15.4	20	15.4	16	12.3	9	6.9	8	6.2	3	2.3	66	50.8
1977-78	113															25	22.1	19	16.8	5	4.4	5	4.4	11	9.7	52	46.0
1978-79	101																	22	21.8	19	18.8	11	10.9	10	9.9	44	43.6
1979-80	101																			21	20.8	16	15.8	9	8.9	57	56.4
1980-81	74																					15	20.3	12	16.2	47	63.5
1981-82	53																							13	24.5	40	75.5

[a] Totals by year may not equal number of entering teachers as a result of some teachers re-entering the profession.

Table 6

Occupations Entered by Secondary Vocational Agriculture Teachers Leaving Teaching, 1971-1983

Year Left	Occupation Entered Upon Leaving Teaching										Total	
	Other School Employment		Farming		Business or Industry		Retirement or Death		Other			
	f	%	f	%	f	%	f	%	f	%	f	%
1970-71	10	20.8	12	25.0	14	29.2	5	10.4	7	14.6	48	100.0
19[illegible]	11	20.4	12	22.1	17	31.5	11	20.4	3	5.6	54	100.0
1972-73	11	16.4	15	22.4	27	40.3	8	11.9	6	9.0	67	100.0
1973-74	14	20.9	9	13.4	29	43.3	6	9.0	9	13.4	67	100.0
1974-75	15	23.8	11	17.5	20	31.7	10	15.9	7	11.1	63	100.0
1975-76	9	12.5	14	19.4	32	44.4	13	18.1	4	5.6	72	100.0
1976-77	14	16.1	22	25.3	35	40.2	8	9.2	8	9.2	87	100.0
1977-78	10	10.4	15	15.6	49	51.1	13	13.5	9	9.4	96	100.0
1978-79	13	13.5	31	32.3	29	30.3	10	10.4	13	13.5	96	100.0
1979-80	16	17.4	18	19.6	24	26.1	12	13.0	22	23.9	92	100.0
1980-81	10	13.5	17	23.0	29	39.1	9	12.2	9	12.2	74	100.0
1981-82	7	9.1	10	13.0	37	48.0	11	14.3	12	15.6	77	100.0
Totals	140	15.7	186	20.8	342	38.3	116	13.0	109	12.2	893	100.0

Actual and Desired Role Perceptions of Teachers of Vocational Agriculture

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ACTUAL AND DESIRED ROLE PERCEPTIONS OF TEACHERS OF VOCATIONAL AGRICULTURE

High school vocational agriculture programs, historically, consist of many important components. In addition to the instruction of the high school class, directing the activities of the Future Farmers of America has typically been accepted as an essential part of the role of the vocational agriculture teacher. Also, the practice of using advisory councils of lay citizens for assistance in conducting vocational agriculture/agribusiness programs, the conduct of adult and young farmer programs, and the use of supervised occupational experience programs have been common in vocational agriculture/agribusiness education throughout its history. Wherever and whenever each of these components is efficiently and effectively conducted, the primary goals of the total vocational agriculture/agribusiness program are usually accomplished.

However, recent evidence has indicated that problems exist in various program areas. These problems seem to emanate from what the researchers, borrowing from sociologists, call role conflict on the part of the vocational agriculture/agribusiness teacher. This role confusion seems to be a national phenomenon among the vocational agriculture/agribusiness teachers.

Objectives of the Study

The primary purpose of this study was to determine whether there is a discrepancy in the actual and desired role perceptions of vocational agriculture teachers.

Specific objectives formulated to guide the researchers included:

1. To identify the actual role of the vocational agriculture teacher as perceived by teachers of vocational agriculture.
2. To identify the desired role of the vocational agriculture teacher as perceived by teachers of vocational agriculture.
3. To determine the discrepancies between the actual and desired roles as these roles are perceived by vocational agriculture teachers.
4. To identify the major factors perceived as contributing to the existence of the discrepancies between actual and desired roles of the vocational agriculture teacher.
5. To determine the relationship between role perceptions and selected demographic characteristics of vocational agriculture teachers.

Methods

A researcher-designed closed-form questionnaire was utilized in this study. Respondents were asked to indicate how desirable each of 21 roles was for the success of the Vo-Ag teacher and the Total Vo-Ag Program (TVAP) using a 7 point Likert-type scale. Responses were recorded on two subscales of (a) actual and (b) desired in relation to each of the roles. Respondents were also to indicate how critical each of 19 external factors was for these successes.

Instrument validation was pursued by using a panel of experts consisting of teacher educators in agriculture, state supervisors of vocational agriculture/agribusiness programs, and experienced Vo-Ag teachers. The final questionnaire was then developed and mailed out. Non-response follow-up procedures utilized included: a reminder card two weeks after the initial mail out; a second instrument four weeks after the initial mail out; and a telephone call made to each of the remaining non-respondents.

Data were transformed from the original 7-point scale to a 13-point Likert-type scale based on the certainty method of assigning values to responses (Warren, et al, 1969). The underlying assumption of this technique is that response values have unequal intervals. Tails of the original scale are spread out while the middle is pushed together. Data were then coded, keypunched, and analyzed using the Statistical Package for the Social Sciences, (SPSS).

Scale reliabilities were determined using Cronbach's alpha reliability coefficient. Table 1 presents the calculated reliabilities of the instrument scales utilized in this study. These reliabilities range from .83 for the factor scale to .93 for the desired role scale.

Table 1

Reliability of Role Perception and Factor Scales

Scale	N	Number of Items	Reliability[a]
Desired role	86	21	.93
Actual role	86	21	.89
Factors	95	19	.83

[a] Cronbach's Alpha Reliability Coefficient

Descriptive statistics of means and frequencies were computed. In addition, two scales of practical significance were constructed by the researchers. A Scale of Practical Significant Discrepancies (SPSD) was used to measure differences in actual and desired role perceptions. This process was employed to avoid the use of multiple t-tests which would have clearly caused inflation of the alpha error. Also, a Scale of Practical Significant Relationships (SPSR) was utilized to determine the significance of relationships between various perceptions and selected demographic characteristics of teachers for the educational practitioner's use.

Data Sources

The population in this investigation consisted of all Vo-Ag teachers in Louisiana with three or more years of teaching experience. A simple random sample of 100 was selected from the population of 269 teachers using the 1982-83 Vocational Agriculture/Agribusiness Directory. Usable responses were received from 97 teachers which accounted for a 97 percent response rate.

Results

Findings of the study are presented according to the following categories: (1) demographic characteristics of respondents, (2) perceived (3) resultant discrepancies, (4) major influencing factors, and (5) relationships between role perceptions and selected demographic variables.

All mean ratings, which are in parentheses, are based on a 13-point Likert-type scale. Discrepancies (d's) are also in parentheses and reported as absolute values.

Demographic Characteristics

Respondents in this study had the following general characteristics:

1. Over 43% of the respondents were in the 30-39 year age group, while almost 27% were 45 years or older. Less than 3% were under 25 years of age. (See Table 2)
2. Thirty-four percent had less than 10 years of teaching experience and slightly more than 5% had taught for 30 years or more. (See Table 3)
3. Nearly one-half (46.4%) of the population held the bachelor's degree, while about 3% had the Educational Specialist Certificate, and slightly over 2% had doctorates. (See Table 4)
4. Approximately 82% were enrolled in Vo-Ag in high school while just over 17% never studied Vo-Ag prior to college.
5. Almost 76% of those who had Ag in high school studied Vo-Ag for 4 or more years while approximately 24% had between 1 and 3 years of agriculture. (See Table 5)
6. Almost 3/4 of the respondents said that their Vo-Ag teacher had some influence on their decision to become teachers, and over 46% indicated that this was a great influence.
7. When asked whether they would become a Vo-Ag teacher if they could "do it all over again," 72% said definitely and over 16% said probably. Only 8% indicated no while 3% said it was doubtful.
8. Agricultural education was the college major for more than three-quarters (78.4%) of the population; and about 5% had dual majors. The remainder of the respondents majored in some other area of agriculture.
9. To the question: "To what extent are you satisfied with your job as a Vo-Ag teacher?" almost 93% indicated they were fairly satisfied or better of which 34% were most satisfied. Only about 2% were least satisfied and the remaining 5% were less than fairly satisifed.

Perceived Roles

Table 6 and Table 7 show the mean ratings of teachers' perceptions of their actual (i.e. what they do) and desired (i.e. what they ought to do) roles. The descriptors used with the response scale for actual and desired

Table 2

Frequency Distributions of Respondents by Age Group

Age Group	N	Percent
Less than 25	2	2.1
25-29	16	16.5
30-34	21	21.6
35-39	21	21.6
40-44	11	11.3
45 or more	26	26.8
	97	100.0

Table 3

Frequency Distribution of Respondents by Years of Teaching Experience

Years	N	Percent
3-6	20	20.6
7-10	22	22.7
11-13	13	13.4
14-17	17	17.5
18-21	8	8.3
22 or more	17	17.5
Total	97	100.0

Table 4

Frequency Distributions of Respondents By Highest Academic Qualification

Qualification	N	Percent
Bachelor's	45	46.4
Master's	27	27.8
M.S. + 30	20	20.6
Education Specialist	3	3.1
Doctorate	2	2.1
Total	97	100.0

Table 5

Frequency Distributions of Respondents By Years of Pre-College Vocational Agriculture

Years	N	Percent
One	4	5.1
Two	1	1.2
Three	13	16.5
Four	54	68.4
Five	6	7.6
Other	1	1.2
Total	79	100.0

roles included: 1 - Least desirable; 7 - Fairly desirable and 13 - Most desirable.

The leading perceived actual role was that of the teacher (11.57). Other roles with relatively high mean ratings included FFA chapter advisor (11.47); department accountant (10.67); program manager (10.20); leader (10.14); department administrator (10.11); and program organizer (10.10). The lowest of the perceived actual roles with mean ratings below 9.00 were change agent for the community (8.43), researcher (8.31), and adult/young farmer advisor (7.97).

The three leading perceived desired roles were FFA chapter advisor (12.09), teacher (11.89), and department administrator (11.33). Six other roles exceeded the mean rating of 11.00. The roles receiving low mean ratings included curriculum materials developer (9.97), researcher (9.54), adult/young farmer advisor (9.48), and change agent (9.16).

Although mean rankings were somewhat higher for the desired roles, it is interesting to note that the same two roles were ranked highest and the same four roles were ranked lowest on both scales.

Role Discrepancies and the SPSD

Table 8 shows the Scale of Practical Significant Discrepancy (SPSD) used to classify the role discrepancies as high, substantial, moderate, low, or negligible. This scale was established by the researchers to aid in the interpretation of the data.

Table 9 presents mean differences between actual and desired role perceptions. Examination of the data shows that the greatest discrepancy (d) was found in the role of the adult/young farmer advisor (1.51) followed by that of the program supervisor (1.48) and curriculum designer (1.38). These three roles were classified as high discrepancies. Ten role discrepancies were found to be in the substantial range, and they were the roles of

Table 6

Rank-Ordered Mean Ratings for Perceived Actual Roles of Vocational Agriculture Teachers

Rank	Role	N	Mean Rating
1	Teacher	88	11.57
2	FFA chapter adviser	88	11.47
3	Department accountant	88	10.67
4	Program manager	89	10.20
5	Leader of community	87	10.14
6	Department administrator	89	10.11
7	Program organizer	89	10.10
8	Program planner	88	9.94
9	Program evaluator	88	9.94
10	Curriculum revisor	87	9.87
11	Program supervisor	87	9.82
12	Program coordinator	89	9.75
13	Vocational guidance counselor	87	9.51
14	Consultant	88	9.50
15	Public relations officer	89	9.44
16	Curriculum designer	87	9.29
17	Information dissemination	87	9.16
18	Curriculum materials developer	85	9.06
19	Change agent for community	84	8.43
20	Researcher	88	8.31
21	Adult/young farmer advisor	89	7.97

researcher (1.24), consultant (1.21), department administrator (1.21), information disseminator (1.20), curriculum revisor (1.20), community leader (1.15), program coordinator (1.10), vocational guidance counselor (1.10), program organizer (1.09), and program manager (1.00). Moderate discrepancies existed among four roles. In addition, four roles showed low or negligible discrepancies of which the role of teacher was the smallest (.32).

Major Influencing Factors

Teachers were asked to rate nineteen external factors according to the critical impact of each to teacher and program success. These ratings are reported in Table 10. The six factors considered most critical included: (with mean ratings in parentheses) administrative support (11.87), attitude of Vo-Ag students (11.46), availability of funds (11.44), parental support (11.23), availability and adequacy of facilities (11.16), and general tone of school (discipline) (11.00). Factors receiving the lowest mean ratings were local politics (8.85), performing non-academic duties (8.72), and the teaching of subjects other than Vo-Ag (7.20).

Table 7

Rank-Ordered Mean Ratings for Perceived Desired Roles of Vocational Agriculture Teachers

Rank	Role	N	Mean Rating
1	FFA chapter advisor	90	12.09
2	Teacher	91	11.89
3	Department administrator	92	11.33
4	Program supervisor	91	11.30
5	Leader of community	91	11.29
6	Program manager	92	11.21
7	Program organizer	92	11.20
8	Curriculum revisor	92	11.08
9	Department accountant	91	11.07
10	Program coordinator	90	10.86
11	Program planner	92	10.79
12	Program evaluator	92	10.72
13	Consultant	91	10.71
14	Curriculum designer	93	10.67
15	Vocational guidance counselor	91	10.53
16	Public relations officer	92	10.40
17	Information disseminator	91	10.36
18	Curriculum materials developer	93	9.97
19	Researcher	92	9.54
20	Adult/young farmer advisor	92	9.48
21	Change agent for community	90	9.16

Table 8

The Scale of Practical Significant Discrepancy (SPSD) Used to Assess Discrepancies Between Perceived Actual and Desired Roles

Discrepancy Range (Mean Differences)	Degree of Practical Significance
Less than .50	Negligible
.50 - .74	Low
.75 - .99	Moderate
1.00 - 1.24	Substantial
1.25 or more	High

Table 9

Rank-Ordered Raw Mean Differences Between Perceived Actual and Desired Roles of Vocational Agriculture Teachers

Rank	Role	Discrepancies
1	Adult/young farmer advisor	1.51
2	Program supervisor	1.48
3	Curriculum designer	1.38
4	Researcher	1.24
5	Consultant	1.21
5	Department administrator	1.21
7	Information disseminator	1.20
7	Curriculum reviser	1.20
9	Leader of community	1.15
10	Program coordinator	1.10
10	Vocational guidance counselor	1.10
12	Program organizer	1.09
13	Program manager	1.00
14	Public relations officer	0.96
15	Curriculum materials developer	0.91
16	Program planner	0.85
17	Program evaluator	0.77
18	Change agent	0.73
19	FFA chapter advisor	0.62
20	Department accountant	0.50
21	Teacher	0.32

Relationships Between Selected Characteristics of Teachers and Their Role Perceptions

A. Table 11 shows the Scale of Practical Significant Relationships (SPSR) on which the discussion of findings in this section are based. Only those relationships classified as moderate or higher are presented here.

1. The age group and years of teaching experience of teachers each showed moderate to high relationships with the following six actual roles: curriculum revisor (r's=.38 and .36 respectively), curriculum designer (r's=.25 and .32), department accountant (r's=.36 and .28), curriculum materials developer (r's =.28 and .26), researcher (r's=.21 and .26), and adult/young farmer advisor (r's=.23 and .24). In addition, years of teaching experience had moderate relationships with the actual roles of program planner (r=.24) and program evaluator (r=.23).

2. Two inverse relationships were found between the number of years teachers were enrolled in high school vocational agriculture and their perceptions of both the actual and desired role of program evaluator (r's= -.22 and -.29 respectively). In addition, there was a moderate and positive

Table 10

Rank-Ordered Mean Ratings of Nineteen Factors That Influence the Role of the Vo-Ag Teacher and Success of the Total Vocational Agriculture Program

Rank	Influencing Factor	Mean Rating N = 96
1	Administrative support	11.87*
2	Attitude of Vo-Ag students	11.46
3	Availability of funds	11.44
4	Parental support	11.23
5	Availability and adequacy of facilities	11.16
6	General tone of the school (discipline)	11.00
7	State supervision of Vo-Ag programs	10.93
8.	Community support	10.90
9.	Teacher salary	10.69
10.	Needs of the school community	10.32
11.	Support of other departments in school	10.03
12.	Type (economic activity, etc.) of the school community	9.59
12.	Support from teacher's own family	9.59
14.	Vo-Ag program serving as "dumping ground"	9.35
15.	Long, odd work hours	9.22
16.	Lack of opportunities for professional advancement	9.02
17.	Local politics	8.85
18.	Assuming non-academic roles	8.72
19.	Teaching other subjects	7.20

*N=95

relationship between this same characteristic and the desired role of program coordinator. (r=.24)

3. Relationships between teachers' overall rating of satisfaction with their job and their perceptions of actual and desired roles were measured. Roles which correlated at a moderate or higher level were the desired roles of curriculum materials developer (r=.23), department administrator (r=.31), program evaluator (r=.34), and program organizer (r=.44) and the actual role of teacher (r=.25).

B. To assess the relationship between roles and certain nominal level demographic variables, the eta coefficient was utilized with one way ANOVA and Scheffe's test as the post-hoc procedure. The results are presented in Table 12 and Table 13.

1. Academic Qualification. Teachers with the M.S.+ 30 status perceived the actual roles of curriculum designer, program organizer, and program planner as more desirable than those who held a B.S. degree.

Table 11

The Scale of Practical Significant Relationships (SPSR) Used to Assess Relationships between Role Perceptions and Selected Demographic Variables

Range*	Descriptor (Degree of Relationship)
Less than .15	Negligible
.15-.19	Low
.20-.24	Moderate
.25-.29	Substantial
Greater than .29	High

*Absolute values for Pearson r

Table 12

Relationships Between Selected Characteristics of Vo-Ag Teachers and Their Perceived Roles.

Demographic Characteristic	Role	*Eta
I. Academic Qualification	1. Program Planner (actual)	.44
	2. Curriculum Designer (actual)	.41
	3. Program Organizer (actual)	.39
II. College Agricultural Education in Retrospect	1. Teacher (desired)	.51
	2. Teacher (actual)	.49
	3. Department Administrator (desired)	.42
	4. Program Planner (desired)	.40
	5. Leader (desired)	.37
	6. FFA Chapter Advisor (desired)	.35

*Eta values are all significant at $p < .05$

2. Retrospection of College Agricultural Education Program. Teachers who indicated a definite "Yes" to the question: "If you had to do it all over again would you major in agricultural education?" perceived six roles to be more desirable than one or more of the other groups.

This group differed significantly from those who responded "No" on the desired role of program planner. Teachers who responded "Yes" also differed significantly, on both the actual and desired role of teacher from the "Doubtful" and "No" groups. In addition, the "Probably" group differed from the "Doubtful" group on the desired role of teacher.

The group that responded "Yes" also differed significantly from the "Doubtful" group on the desired roles of department administrator, FFA chapter advisor, and leader. In addition, the "No" and the "Doubtful" groups differed significantly on the desired role of FFA chapter advisor while the "Probably" and "Doubtful" groups also differed significantly on the desired role of leader.

Table 13

Post Hoc Analysis of Teacher's Role Perceptions by Selected Variables

17a. Role Perceptions Related to Academic Qualification

	Level of Qualification				
Role	B.S.	M.S.	M.S+30	EdS.	Ph.D.
Curriculum Designer (actual)	8.61+	9.13	11.12+	8.00	11.50
Program Organizer (actual)	9.32+	10.04	11.88+	10.33	11.50
Program Planner (actual)	9.44+	9.58	11.71+	8.00	13.00

17b. Role Perceptions Related to College Ag Education Program in Retrospect

	Level of Retrospection			
Role	Yes	Probable	Doubtful	No
Program Planner (desired)	11.28+	10.60	9.00	8.14+
Teacher (actual)	12.20+*	10.69	8.00+	9.87*
Teacher (desired)	12.32+*	11.67#	8.00+#	10.00*
Department Administrator (desired)	11.88+	10.60	8.00+	9.71
FFA Chapter Advisor (desired)	12.18+	11.93	9.00+*	13.00*
Leader (desired)	11.52+	11.40*	7.33+*	11.00

Note: Similar symbols (+,*,#) used in the same row in Table 17 indicate statistically significant differences found between the identified groups ($p < .05$)

Conclusions

From the preceding results of the study the following conclusions were drawn:

1. The traditional roles of the teacher, the FFA chapter advisor, the department accountant and community leader will continue to be perceived by Vo-Ag teachers as primary roles of the Vo Ag teacher.

2. The magnitude of the discrepancy in each pair of roles (actual versus desired) seems to relate to the traditional-non traditional schism between roles. Great discrepancies tend to exist were the role pair is more non-traditional (e.g. researcher) than traditional. Conversely, smaller discrepancies exist among the more traditional roles (e.g. teacher).

3. Factors influencing teacher and program success underscore some of the basic issues and problems of vocational education in general and vocational agriculture in particular: funding, support from the school administration, parental support, availability of facilities, and school discipline.

Recommendations

Recommendations based on this study are directed more at the development of programmatic scheme for further investigations on the concept of the "total role" of the Vo-Ag teacher than on specific prescriptive suggestions. Three recommendations were made as follows:

1. The preservice phase of teacher education not only delineate what program areas should comprise the Total Vo-Ag Program but also clearly analyze and describe the concept of the "total role" of the teacher. Such knowledge and information has to be incorporated into the undergraduate and/or graduate programs.

2. Inservice programs for teachers should be designed and developed as parallels to the preservice teacher preparation component that would address the "total role" concept and how it should be assumed and performed satisfactorily.

3. The role of the Vo-Ag teacher has a direct bearing on his/her success and that of Vo-Ag program. However, other major factors such as personality traits (internal factors) and teacher perceptions of what constitutes a Total Vo-Ag Program do impact on the teachers' roles. What roles he/she can assume and how well each role is performed are, at least inpart, determined by these factors. Therefore, systematic efforts need to be made to investigate the relationships between these factors and the role of the Vo-Ag teacher.

Reference

Warren, Richard D. et al. The Certainty Method: Its Application and Usefulness in Developing Empirical Measures in Social Sciences. Ames, Iowa: Iowa State University. 1969.

CRITIQUE OF RESEARCH
1983 NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING

by

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INTRODUCTION

It is a pleasure to be able to serve as a discussant for this session of our national research meeting. The main problem I had in trying to evaluate the papers was that I did not have copies of the instruments used in the research for any of the three studies. In addition, due to the limits placed on the length of the paper submissions, the authors were not able to include all the information about procedures, data sources, etc. that they may have included if they had had more room. I have attempted to listen during the presentations for any information that may clarify my concerns about the papers presented and will modify my comments accordingly. My written comments to be included in the proceedings will be based solely on the written papers.

CRITIQUE - PAPER NUMBER 1:
TEACHER TOLERANCE AND ITS RELATIONSHIP TO DISCIPLINARY EFFECTIVENESS.
AUTHORS: ROSEMARIE CUNDIFF AND L. H. NEWCOMB

Strengths

The idea behind this study was well conceived. This study focused on a topic that seems to be the "talk of the town." Certainly, teacher tolerance of misbehavior in vocational programs is an appropriate topic for study.

I wish to complement the researchers for expending considerable effort in the design of this study. An effort was made to secure information from almost everyone who could offer a contribution to the research effort.

No sampling error was involved in this study since entire populations were used. The reliability estimate for the instrument was .88 or higher as measured by Cronbach's alpha. Frame and nonresponse error cannot be adequately reviewed by the discussant based on the information given; however, it appears that neither type of error exists in this study.

Questions and Concerns

In reading the paper, several questions came to mind. I have to wonder why a purposive sample was taken for this study. There may be perfectly legitimate reasons; however, I was unable to ascertain these reasons from the paper.

Another question I had was in regard to the procedure used to place the teachers into disciplinary effectiveness rating categories. The administrators were asked to place their teachers into one of three categories. In addition, they were told to place no more than two-thirds of their teachers in any one category. It seems that this procedure had the potential of biasing the study because some administrators could place the "second third" of teachers in the second category while other administrators could place them all in the first category.

I am also curious about the source of 32 events included in the Teacher Reaction Profile that tend to bother a person. I assume that these were gathered from the literature; however, I was unable to tell from the paper. Also, if 32 events were used as indicated on page 4 of the paper, then how could possible scores on the profile range from 28 to 112. This was not explained in the paper.

Another question I had was about the statement that the classroom observations supported the teacher tolerance scores in 50 percent of the cases, i.e., that the scores ranged in a tolerance category that matched the opinion of the observer. I could not find any evidence in the paper that indicated how these tolerance categories were developed or what rationale or procedure was used to assign the actions to specific categories.

I would have liked for the researcher to have done some analysis of the relationships among frequency, bothersomeness, and tolerance of misbehaviors as perceived by teachers and students. For example, a correlation of .92 exists between the bothersomeness and tolerance responses which seems to indicate that these two factors fluctuate together.

I have another question about the scale used to report teacher tolerance levels. Although it is apparent that the author attempted to design the scale in a neutral manner, the number 2 position on the scale was described as "usually tolerates; rarely intervenes" while the number 3 position on the scale was described as" "seldom tolerates; usually intervenes". The term "rarely" may equate to "seldom", however, it would have been much simpler to use identical wording for the two positions.

In summary, I would like to commend the authors, Rosemarie Cundiff and L. H. Newcomb, on a job well done. They have certainly made a valuable contribution to this meeting in the area of disciplinary effectiveness.

CRITIQUE - PAPER NUMBER 2:
METHODS USED FOR TEACHING LIVESTOCK SKILLS IN OHIO VOCATIONAL AGRICULTURE PROGRAMS.
AUTHOR: ED OSBORNE

Strengths

I would like to commend Ed for being in that seemingly small group of researchers who actually followed up their own recommendations that were made in previous studies. Ed presented a paper at this meeting last year entitled "Livestock Skills Taught in Vocational Agriculture Classes and Possessed by Current and Prospective Ohio Agricultural Production Teachers." Those of you who have a special interest in the teaching of livestock skills may wish to refer back to that paper.

I felt this study was thorough in research methodology and design, strong in instrument development, and strong in the development of conclusions and recommendations. I commend the author for studying and finding the answers to questions that many of us have posed several times, even though I was not pleased to hear that only 14 percent of the livestock skills being taught were being taught using the hands-on approach.

The author did an excellent job of identifying a researchable topic and carrying the study out with a good measure of quality. He skillfully attacked one of our sacred cows—whether we really practice what we preach about hands-on skill development. In a technical area where most of us would have said that these skills are uniformly taught with hands-on experience, this research gives us ample reason to believe that we may be wrong.

Ed is to be commended for being able to design his instruments in a way that he was able to attain such a high test-retest reliability coefficient. On this study, he achieved a r-value of .98. On the study he reported last year, he achieved r-values of .99 and .98 using the test-retest procedure. I would certainly like to know his secret.

Questions and Concerns

It was rather difficult to come up with any truly significant questions and concerns about this study. I could question the author's statement that "potential measurement, nonresponse, frame and sampling errors were controlled via the research methodology utilized." However, since the information provided in the paper on research methodology was somewhat limited, I was unable to ascertain if this was so.

For example, I question whether a 20 percent follow-up of nonrespondents was sufficient in this case. Granted, the author did secure an excellent response rate of 82 percent and a case could easily be made for not conducting any follow-up procedures. However, since the author chose to double sample, care should be taken to insure that a sample of sufficient size is taken. A 20 percent follow-up of nonrespondents amounted to only 4 in this case, hardly enough to base a sound decision about differences between respondents and nonrespondents.

Another question I could ask would be about the emphasis that appeared to be placed on on whether all the skills identified were taught in all the schools used in the study. Livestock skills taught in a vocational agriculture program should be selected based on the types of livestock production existing in the area. I did not share the author's concern about the percentage of skills being taught, although I was concerned about how they were being taught.

The last question I could offer would be in regard to the procedure used to record responses about the teaching method used. Ed stated that the teachers were asked to indicate what teaching method was used to teach each of the livestock skills. If they circled more than one, the "highest" level method was recorded. This procedure leads me to question the validity of his findings.

In summary, I would like to compliment the author, Ed Osborne, on a well conducted and reported study.

CRITIQUE - PAPER NUMBER 3:
TIME-ON-TASK BEHAVIOR OF PUPILS ENROLLED IN VOCATIONAL HORTICULTURE LABORATORIES.
AUTHOR: JANET L. HENDERSON

Strengths

This was another well conceived, well planned, well conducted study. I especially liked the laboratory management emphasis of the study. With all the uproar about the quality of public education, it was refreshing to see research being conducted in an area that has potential for immediate impact. Time-on task research certainly has the potential for improving the delivery of vocational education.

The author is to be commended for paying careful attention to potential methodological problems and planning the study to eliminate these weaknesses. The Survey of Pupil Opinion instrument was tested for reliability and yielded an r-value of .82. It appeared that the reseacher invested considerable time and effort in this study.

Questions and Concerns

First, I would have liked to have known the procedures used to determine the reliability of the pupil opinion survey. It was impossible to evaluate this aspect of the paper based on the information presented.

Another question I had was why two horticulture classes were used in the study at one school while only one class was used from the other three schools. Although there may be a good rationale for this, it was not disclosed in the paper. It would seem that the characteristics of the teacher and the school where two classes were used would unduly influence the results of the study.

Even though a purposive sample was necessitated by the use of intact groups, I would have like to have known if the schools used were selected on a random, purposive or other basis. This would have helped the reader determine the generalizability of the data, even though the author correctly disclaimed generalizability.

Another question I had was about the validation of the laboratory observation form. The author stated that the instrument was validated among average and below average vocational pupils. However, there was no indication that this was a factor in selecting schools for the purposive sample.

Another area of concern was conclusion number 1. I did not find data in the findings section which supported the conclusion that "an increase in laboratory instructional time does not always correspond with an increase in time-on-task behavior."

Also, conclusion 6 claims that teacher variables explain a greater proportion of the variance in time-on-task scores as compared to pupil variables. Although I do not doubt this conclusion, I would have liked for the data supporting this conclusion to have been included in the paper.

In addition, I question the recommendation that both male and female pupils need to be involved in all aspects of laboratory instruction. I did not see where this aspect was a part of the objectives of the study or where data were collected that indicated that this was a problem.

These were some of the questions I couldn't answer due to a lack of information in most cases. This appears to be a sound, well conducted study and I congratulate Janet on a job well done.

TEACHER TOLERANCE AND ITS RELATIONSHIP TO DISCIPLINARY EFFECTIVENESS

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INTRODUCTION

The teaching profession is faced with a continuous problem of discipline in the classroom. As long as there are students and classroom teachers, this problem can be expected to continue. Classroom teachers will frequently name discipline as one of the major concerns in teaching.

Determining when and how to react to student misbehavior has perplexed teachers for centuries. The teachers' response to misbehavior was the focus of this research. That is, what degree of tolerance of misbehavior does a teacher possess? How often does teacher intervention occur when misbehaviors occur? Some teachers have an intolerance to a disruptive situation, while others are very tolerant to the same disruptive act.

It is believed that each teacher possesses a threshold of tolerance. A teacher who is highly perceptive of discipline problems and chooses not to ignore the misbehavior can be said to have a low tolerance of disruptive behavior. Conversely, a teacher who is aware of disruptive events but chooses to ignore them is said to have a high tolerance of disruptive behavior.

Thompson (1976) examined the threshold of tolerance that the teacher can accept and still maintain a productive learning environment. He argued that this level cannot be predetermined, but rather is a part of a teacher's personality. Hence, what may be perceived as a problem by one teacher may not be perceived as a problem by another teacher. He felt that teachers would have far fewer discipline problems simply by increasing their own tolerance levels of student behavior.

The literature substantiates the existence of teacher tolerance. An important phase of this study was the development of instruments to measure teacher tolerance of disruptive behavior. Tolerance is the extent to which the teacher does not intervene in student classroom misbehavior. No other scales of measurement existed to measure teacher tolerance.

Furthermore, the researchers wanted to know to what extent teacher tolerance of disruptive behavior was related to the disciplinary effectiveness of a teacher. This study was designed to provide information regarding such concerns.

PROBLEM AND OBJECTIVES

The purposes of this study were to describe the degree of teacher tolerance of disruptive behavior of students and determine the extent to which this tolerance was related to effectiveness as a disciplinarian. This study was designed to answer two major research questions.

1. To what extent do high school vocational teachers vary in the degree of teacher tolerance of student misbehavior as measured by the Teacher Reaction Profile and the Classroom Observation Checklist?

2. To what extent are the measures of teacher tolerance related to classroom disciplinary effectiveness as perceived by the director of the school, the supervisor of the teacher, the students and the teacher?

METHODOLOGY

Population

The population used for this study was purposely selected to include all teachers at two vocational schools. These schools were located in the western portion of Ohio. The study was conducted during the months of January - April 1982. There were 164 teachers, 153 spouses or close friends of the teachers, 2,888 students in grades 11 and 12, four directors and nine supervisors who participated in the study.

Instrumentation

Each instrument, developed by the researchers, was sent to a four-member panel of experts to determine content validity. Needed changes were made as suggested.

The instruments were pilot tested at the Delaware Joint Vocational School in Delaware, Ohio. The population for the pilot test included 11 vocational instructors who volunteered to participate. One hundred fifty-five students, one director and three supervisors also participated.

Reliability for the Teacher Reaction Profile and the Classroom Observation Checklist was established using the Cronbach alpha procedure. The reliability for the Teacher Reaction Profile was r = .91. By eliminating selected items, the reliability improved to r = .93. The reliability for the Classroom Observation Checklist when completed by teachers was r = .93 for the frequency scale, r = .98 for the bothersomeness scale, and r = .95 for the tolerance scale. When this instrument was completed by students, the reliability indices were r = .94 (frequency), r = .94 (bothersomeness), and r = .88 (tolerance).

The reliability of the instruments, when used with the subjects in this study, was comparable to the data reported above.

Procedures

After the pilot study was completed; individual, personal, tape-recorded interviews were conducted with each director of the two vocational schools and all supervisors at the two schools. The purpose of conducting the tape recorded interviews was to have the administrators place their staff, which they directly supervised, in one of the three following disciplinary effectiveness categories: top one-third (among the best in discipline); middle one-third (about average in discipline); lower one-third (below average in discipline).

These ratings were based on the opinion of the administrators comparing each teacher's disciplinary effectiveness to all other teachers that he/she had supervised. Individually the administrators were presented a stack of cards with the name of each teacher they directly supervised on a separate card.

The administrators were asked to place each teacher into one of the three disciplinary effectiveness rating categories. They were also told to place no more than two-thirds of their teachers in any one category. This was done to insure variability in the distribution among categories.

As the session proceeded, the interviewer interrupted the administrator in order to ask certain questions concerning the ratings. Questions were asked about the characteristics of teachers in each of the three categories. This procedure was utilized to help the administrators establish a clear and publicly stated frame of reference that would be used in guiding their decisions.

After the interview was completed, all teachers in the population were given an instrument packet. The packet requested demographic data (teacher's age, sex, and years of teaching experience), a self rating of disciplinary effectiveness, Teacher Reaction Profile and Classroom Observation Checklist.

The Teacher Reaction Profile contained a list of 32 events which commonly occur in life that tend to bother a person. The instrument served as one measure of tolerance. The Classroom Observation Checklist contained a list of 27 common classroom misbehaviors.

Three scales were included on this instrument. The first served to measure the perceived frequency of each misbehavior. The second scale served to assess to what degree the teacher was bothered by the misbehavior. The third scale measured the level of tolerance (degree of intervention) the teacher possessed when the misbehavior occurred.

Students were also given a copy of the Classroom Observation Checklist to complete and were asked to rate their teacher's disciplinary effectiveness.

After all teacher and student instruments were collected, a randomly selected group of 10 teachers at each of the two schools were observed while teaching in the related classroom. Teacher observations were made by the researcher for two consecutive days. A classroom observation instrument was used in order to record all misbehaviors and the teachers' reactions to the misbehaviors. The observation provided a check as to the authenticity of teacher and student reported data from the Classroom Observation Checklist.

The observer had no knowledge of tolerance scores from the instruments prior to the observation sessions. Each teacher was interviewed after the second day of observation in order to discover if the observer's presence in the classroom had a reactive effect on the teacher or students. The teachers were also asked in the interview to rate their level of tolerance of disruptive behavior and to comment on the observation field notes.

Data Analysis

Descriptive statistics were calculated to describe the population. Correlation coefficients were computed to show relationships.

FINDINGS

Description of Teachers

Of the 164 teachers in the population, 108 were from School B, while 56 were from School A. Teachers' ages ranged from 21 to 62, with an average age of 42 years. Sixty-two percent of the population were male teachers, while 38 percent were female. The range of years of teaching experience was from 1 to 30 years, with an average of 7.76 years.

Teachers' Tolerance to Life Events

Table 1 shows the distribution of teacher scores as they rated their own tolerance to life events. Responses were on a four-point scale, with a 1 indicating the teacher was extremely tolerant. Scores could have ranged from 28 to 112. The teachers' scores ranged from 43 to 103, with a median of 66.7.

Teachers' Tolerance to Classroom Misbehavior

An additional instrument was utilized to measure teacher tolerance. The Classroom Observation Checklist was designed to measure a teacher's tolerance to specific classroom misbehaviors. A list of 27 commonly occurring misbehaviors was provided. The teachers rated each behavior on the frequency with which it occurred in their class, how bothered they were when it occurred and how tolerant they were of it.

The same instrument was also given to all vocational students in the study. They rated the misbehaviors for their vocational programs. The teachers' reactions to the misbehavior were rated according to students' perceptions.

Table 2 contains the mean scores and rank order for the 27 misbehaviors. The misbehaviors are listed in rank order of frequency as rated by the teachers. The most frequent misbehavior, as reported by the teachers, was: bothering other students by talking. Students ranked this misbehavior as third in frequency.

The misbehavior that most bothered the teacher was: vandalism to school property. This misbehavior was also least tolerated by the teachers.

Table 3 reveals the teachers' scores on the Classroom Observation Checklist as perceived by teachers. The mean score was 3.26 which indicates that teachers were seldom tolerant of misbehaviors and usually intervened. The range of scores was from 2.33 to 4.00.

Table 3 also shows the teacher tolerance scores to misbehaviors as perceived by students. The range of scores was from 2.3 to 3.58, with a mean score of 2.96.

The classroom observations supported the teacher tolerance scores in 50 percent of the cases; that is, in 10 of the 20 cases, the scores ranged in a tolerance category that matched the opinion of the observer. In the remaining 50 percent of the cases, the teacher seemed either more or less tolerant of misbehaviors to the observer than was indicated by the scores which were reported by students and teachers.

Disciplinary Effectiveness Ratings

Each teacher was evaluated by the school director, supervisor, students and him/herself as to the disciplinary effectiveness of the teacher. Director and supervisor ratings were made during a tape-recorded interview as described earlier. Students and the teachers themselves likewise categorized the teacher in the top one-third (among the best disciplinarians), middle one-third (about average in disciplinary effectiveness), lower one-third (below average in disciplinary effectiveness).

Table 4 shows the breakdown by categories of the disciplinary effectiveness ratings made by directors, supervisors, and teachers. Directors judged more teachers to be in the middle one-third category (47.6 percent), with a mean score of 1.71.

Supervisors rated more teachers in the middle one-third category (42.1 percent) of disciplinary effectiveness. The mean score was 1.77.

Teachers gave themselves a mean rating of 1.59, compared to the administrators' mean rating of 1.77 for supervisors and 1.71 for directors. The majority of the teachers (51.2 percent) placed themselves in the middle one-third category. Students ranked their teachers as slightly less effective than did the teachers but more effective than did the supervisors or directors (see Table 5).

Student ratings were calculated as a class average. The mean number of students per class was 17.6 students. The mean rating by students of their teachers' disciplinary effectiveness was 1.63, which was in the middle one-third category.

Relationship of Tolerance Measures to Disciplinary Effectiveness Ratings

In order to describe relationships between multiple measures of teacher tolerance and the various disciplinary effectiveness ratings, correlation coefficients were calculated.

Table 6 contains the relationships between each of the three tolerance measures and each of the four disciplinary effectiveness ratings.

Negligible relationships were found between teachers' tolerance to life events as perceived by teachers and the various ratings of disciplinary effectiveness. Correlations of $r = -.02$, $r = .12$, $r = -.08$, and $r = -.12$ were found when supervisor, director, teacher and student ratings respectively were correlated with each other.

Negligible to low negative correlations were found between teacher tolerance of classroom misbehavior as perceived by the teachers and ratings of disciplinary effectiveness. The highest correlations were found with teacher tolerance of classroom misbehavior and the teacher self-rating of disciplinary effectiveness ($r = -.23$) and student ratings of disciplinary effectiveness ($r = -.21$). This negative correlation indicates that the teacher who scored higher (more intolerant) on the tolerance scale of the Classroom Observation Checklist was rated as being a more effective disciplinarian by the students and by the teachers themselves than was the teacher who scored lower (more tolerant).

Low to substantial negative correlations existed between the teacher's tolerance to classroom misbehaviors as perceived by the students and ratings of disciplinary effectiveness. The correlations between teacher tolerance of classroom misbehavior and disciplinary effectiveness as rated by the students was $r = -.59$. The correlations between teacher tolerance of classroom misbehavior as perceived by the students and disciplinary effectiveness as rated by the teachers was found to be $r = -.29$, as rated by the director, $r = -.25$, and as rated by the supervisor, $r = -.30$. These negative correlations indicate that the teacher judged to be more intolerant was also judged to be a more effective disciplinarian by students, teachers themselves, and administrators.

CONCLUSIONS

1. One cannot very thoroughly explain teachers' level of disciplinary effectiveness based on teachers' tolerance to life event's scores.

2. There is a low to substantial correlation between a teacher's effectiveness as a disciplinarian and a teacher's tolerance to misbehavior as judged by students, administrators, and teachers themselves. Those who are intolerant of misbehaviors will tend to be rated as the better disciplinarians.

3. Some behaviors: students bothering others by talking, whispering and students coming to class unprepared are perceived by the teachers to be the most frequent misbehaviors. Teachers report vandalism and fighting to be the most bothersome and the least tolerated classroom disturbances.

4. The fact that a misbehavior occurs frequently does not necessarily mean that it bothers a teacher nor that it will not be tolerated by a teacher.

5. A misbehavior that is perceived by a teacher to be bothersome is likely to also be perceived as intolerable.

RECOMMENDATIONS

In light of the findings related to teacher tolerance of disruptive behavior and considering that the findings of this study are generalizable to the two schools studied, the following recommendations are offered:

1. Teachers should be made more aware of their individual level of tolerance to disruptive behaviors. They should know which misbehaviors are more frequent, which are bothersome and which they will not tolerate. Supervisors should assist the teacher in monitoring these awareness levels.

2. Additional validation of tolerance instruments can be accomplished by conducting further research on two selected groups of teachers who were judged to be tolerant and intolerant.

3. Further research should be directed to investigate relationships between teacher tolerance and patterns of teacher preparation. One should explore the differences in teachers prepared to teach in standard four-year teacher education programs (B.S. Degree), and programs which prepare persons who come into teaching directly from an industry position (perhaps with no college education). One should also explore the relationships of teacher patterns of preparation with disciplinary effectiveness ratings.

4. Additional investigation should explore the difference in frequency of misbehavior, bothersomeness levels and tolerance levels of teachers in vocational high schools versus traditional academic high schools. Disciplinary effectiveness ratings should also be compared for the two types of schools.

5. More research is needed to discover if changes in teacher tolerance occur in patterns, based upon the time of day, day of the week, or week in the school year. This study would need to be an ongoing and long-term project. Evidence has been provided by Lawrence, Steed, Young (1978) on changes in behaviors of teachers and students depending on the day of the week.

6. More research is needed concerning whether the misbehavior of certain students is tolerated more readily than other students. Hargreaves (1975) is cited in the literature as claiming that older boys are not corrected as frequently as are other misbehaving students, because of teachers' fear of retaliation from the older boys.

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TABLE 1

TOLERANCE TO LIFE EVENTS SCORES AS PERCEIVED BY TEACHERS

Score*	n	%
101 - 106	1	.6
95 - 100	1	.6
89 - 94	2	1.2
83 - 88	3	1.8
77 - 82	8	4.9
71 - 76	38	23.2
65 - 70	50	30.5
59 - 64	38	23.2
53 - 58	18	11.0
47 - 52	2	1.2
41 - 46	3	1.8
35 - 40	0	0
29 - 34	0	0
TOTAL	164	100%

$\overline{X}$	67.16
Mdn	66.70
s	8.65

*A 28 item scale with response set 1-4

1 = Extremely Tolerant
2 = Usually Tolerant
3 = Rarely Tolerant
4 = Never Tolerant

Scores can range from 28-112.

TABLE 2

FREQUENCY, BOTHERSOMENESS AND TOLERANCE OF CLASSROOM MISBEHAVIORS AS PERCEIVED BY TEACHERS AND STUDENTS*

	Frequency				Bothersomeness				Tolerance			
	Teacher Rated		Student Rated		Teacher Rated		Student Rated		Teacher Rated		Student Rated	
Misbehaviors	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank
Bothering Other Students by Talking	2.82	1	2.83	3	3.27	17	3.15	7	3.09	16	3.00	10
Students Whispering	2.77	2	2.84	2	2.77	24	2.71	21	2.78	21	2.68	19
Students Unprepared for Class	2.71	3	2.58	5	3.24	18	2.90	16	3.12	15	2.81	15
Not Following Instructions	2.67	4	2.36	12	3.34	14	3.07	9	3.24	12	3.04	8
Inattentiveness	2.64	5	2.56	6	3.11	20	2.85	18	2.97	19	2.78	16
Student Indifference	2.60	6	2.40	11	3.34	14	2.99	13	2.96	20	2.87	13
Clowning/Foolish Behavior	2.58	7	2.91	1	2.99	23	2.97	15	2.96	20	2.91	12
Not Doing Task	2.57	8	2.53	8	3.28	16	3.03	11	3.15	14	2.92	11
Idleness	2.56	9	2.51	9	3.40	12	3.19	4	3.36	10	3.17	4
Shouting Out Answers in Class	2.48	10	2.55	7	2.71	25	2.56	23	2.70	22	2.53	21
Tardiness to Class	2.43	11	2.53	8	3.31	15	3.03	11	3.50	6	3.06	6
Disrespect of Other Students	2.34	12	2.44	10	3.46	9	2.97	15	3.31	11	2.91	12
Littering	2.22	13	2.10	16	3.39	13	3.02	12	3.45	7	3.06	6
Profanity	2.22	13	2.60	4	3.42	11	2.98	14	3.43	8	2.87	13
Inactive Disobedience	2.19	14	1.98	19	3.50	8	3.08	8	3.40	9	3.02	9
Making Disruptive Noises	2.17	15	2.27	13	3.09	21	2.88	17	3.05	18	2.82	14
Abusing Privileges	2.16	16	[illegible]	[illegible]	3.43	10	3.06	10	3.45	7	3.05	7
Cheating in Class	2.08	17	1.94	21	3.70	3	3.26	3	3.62	4	3.23	3
Lying	2.06	18	1.96	20	3.57	7	3.08	8	3.43	8	3.00	10
Drinking or Eating Food in Class	2.03	19	2.19	15	3.06	22	2.76	20	3.16	13	2.77	17
Walking Around the Classroom without Permission	1.97	20	2.20	14	3.12	19	2.64	22	3.16	13	2.67	20
Disrespect of Teacher	1.92	21	2.03	17	3.61	6	3.16	6	3.45	7	3.05	7
Active Disobedience	1.85	22	1.87	23	3.69	4	3.06	10	3.66	3	3.02	9
Leaving Class without Permission	1.73	23	1.83	24	3.64	5	3.17	5	3.61	5	3.12	5
Mocking a Teacher	1.68	24	1.89	22	3.12	19	2.79	19	3.07	17	2.74	18
Vandalism to School Property	1.67	25	1.65	26	3.90	1	3.43	1	3.91	1	3.43	1
Fighting	1.62	26	1.80	25	3.74	2	3.29	2	3.72	2	3.28	2
Grand Mean	2.25		2.27		3.34		3.00		3.29		2.96	

*A 27 item scale with response set 1-4.

Frequency

1 = Has never occurred
2 = Has occurred once or twice but no more
3 = Recurs with occasional frequency
4 = Has become almost habitual

Bothersomeness

1 = Does not bother at all
2 = Seldom bothers
3 = Usually bothers
4 = Bothers each time it occurs

Tolerance

1 = Always tolerates and never intervenes
2 = Usually tolerates and rarely intervenes
3 = Seldom tolerates and usually intervenes
4 = Never tolerates and always intervenes

TABLE 3

LEVEL OF TEACHER TOLERANCE FOR CLASSROOM MISBEHAVIOR AS PERCEIVED BY TEACHERS AND STUDENTS

Score*	Teachers n	Teachers %	Students n	Students %
3.75 - 4.00	14	8.5	0	0
3.50 - 3.74	31	18.9	3	1.8
3.25 - 3.49	44	26.8	11	6.7
3.00 - 3.24	43	26.3	61	37.2
2.75 - 2.99	19	11.6	61	37.2
2.50 - 2.74	9	5.5	23	14.0
2.25 - 2.49	4	2.4	5	3.1
TOTALS	164	100%	164	100%
$\overline{X}$	3.26		2.96	
Mdn	3.27		2.97	
s	0.35		0.23	

*A 27 item scale with response set 1-4.
1 = Always tolerates; never intervenes
2 = Usually tolerates; rarely intervenes
3 = Seldom tolerates; usually intervenes
4 = Never tolerates; always intervenes

TABLE 4

RATINGS OF TEACHERS' DISCIPLINARY EFFECTIVENESS

Disciplinary Effectiveness Ratings*	Directors n	Directors %	Supervisors n	Supervisors %	Teachers n	Teachers %
1 (Top one-third)	67	40.9	66	40.2	74	45.1
2 (Middle one-third)	78	47.6	69	42.1	84	51.2
3 (Lowest one-third)	19	11.6	29	17.7	6	3.7
TOTALS	164	100%	164	100%	164	100%
$\overline{X}$	1.71		1.77		1.59	
Mdn	1.69		1.73		1.60	
s	0.66		0.73		0.56	

*1 = Judged to be in the top one-third in disciplinary effectiveness
2 = Judged to be in the middle one-third in disciplinary effectiveness
3 = Judged to be in the lowest one-third in disciplinary effectiveness

TABLE 5

STUDENTS' RATINGS OF TEACHERS' DISCIPLINARY EFFECTIVENESS

Disciplinary Effectiveness* Ratings	n	%
1.00 - 1.49	60	36.4
1.50 - 1.99	75	45.5
2.00 - 2.49	27	16.6
2.50 - 2.99	2	1.5
TOTAL	164	100%

$\overline{X}$	1.63
Mdn	1.61
s	0.33

*1 = Judged to be in the top one-third in disciplinary effectiveness
2 = Judged to be in the middle one-third in disciplinary effectiveness
3 = Judged to be in the lowest one-third in disciplinary effectiveness

TABLE 6

RELATIONSHIPS BETWEEN TEACHER TOLERANCE MEASURES AND DISCIPLINARY EFFECTIVENESS RATINGS*

Measures of Tolerance	Raters			
	Supervisor	Director	Teacher	Student
To Life Events (by teacher)	-.02	.12	-.08	-.12
To Misbehavior (by teacher)	-.05	-.02	-.23	-.21
To Misbehavior (by students)	-.30	-.25	-.29	-.59

*Negative relationships indicate that as the teacher was rated as a better disciplinarian they also were judged to be less tolerant.

METHODS USED FOR TEACHING LIVESTOCK SKILLS IN OHIO VOCATIONAL AGRICULTURE PROGRAMS

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INTRODUCTION

Although concern about the technical skill abilities possessed by vocational agriculture teachers has surged tremendously in the last several years, the literature in agricultural education has indicated that technical skill preparation has been an area of interest for many years. As early as 1943, when one would presume that vocational agriculture teachers had extensive farm experience, Rhoad (p.3) stated that "teachers have failed to teach their students how to perform certain vital farm tasks because... they have never performed those tasks themselves and therefore lack the self-confidence necessary to attempt this teaching". Martin (1956) asserted that the ability to perform pertinent manipulative skills is one of the greatest resources needed by a vocational agriculture teacher. Gadda (1963, p.159) stressed that "the confidence of beginning teachers is enhanced perceptibly by adequate skills mastery".

Not only has skill acquisition been important, but the manner in which skills are taught and learned has also been an area of critical concern. Newcomb (1981) maintained that learners must see and practice a stepwise procedure for accomplishing a given task. He emphasized that without demonstrations skill instruction would be poor, and structured student practice is necessary for skill mastery. Hammonds (1950, p. 144) also described the importance of using such methods to teach manipulative skills. He described the kinesthetic sense or the need to "get the feel of" a skill when he insisted that a manipulative skill cannot be acquired by merely watching it being performed or listening to an explanation of how it is performed. According to Hammonds, learners must engage in skill performance and get the feel of things firsthand if the manipulative skill is to be developed.

While these positions suggest approaches to equipping prospective vocational agriculture teachers with the ability to perform manipulative skills, at the same time they suggest approaches to be used in teaching technical skills to vocational agriculture students. Instruction in agriculture has maintained the goal of taking learning to the doing or application level. Vocational agriculture students need to develop the ability to perform the essential skills in technical agriculture areas, such as livestock production. Therefore, the development of technical skills needed in agricultural occupations should represent a significant portion of instructional time in secondary programs.

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Warmbrod (1978) remarked that one measure of quality in vocational agriculture programs is the level of technical competence possessed by those entering the profession. Logically, agricultural educators must also agree that how this technical competence is demonstrated and used when teaching is an additional quality indicator.

OBJECTIVES OF THE STUDY

The development of technical skills in agricultural production programs, especially in livestock production, has presented some specific challenges to teachers. Although teachers may have recognized the need to teach their students to perform the essential skills in livestock production, the extent and nature of this teaching in Ohio agricultural production programs had not been investigated. Therefore, the major purpose of this study was to determine the degree of livestock skill instruction provided by agricultural production teachers in Ohio and the methods reportedly used for this teaching.

The following research questions provided focus for the study:

1. What was the frequency of teaching livestock skills in Ohio vocational agriculture programs as reported by agricultural production teachers?
2. What were the self-reported teaching methods used for livestock skill instruction?
3. What was the relationship between self-perceived livestock species importance, the teaching of livestock production in general, and the teaching of livestock skills?
4. What was the relationship between years of teaching experience and frequency and type of livestock skill instruction?

METHODS AND PROCEDURES

The research design implemented in the study was classified as descriptive correlational. Potential measurement, nonresponse, frame and sampling errors were controlled via the research methodology utilized. The target population included all Ohio agricultural production teachers employed during the 1981-82 school year. The 1981-82 Ohio Agricultural Education Directory served as the frame for this population (N = 323).

Since the intent of the study was to determine if and how livestock skills were being taught, an initial phase of instrumentation development was to determine the skills that were important in producing a particular livestock species. The essential skills for producing swine, beef, dairy, and sheep were first identified through an extensive literature review. Four Ohio State faculty members in the College of Agriculture (one for each species) were then selected to review and modify the initial list of skills. Finally, a top producer in each species was personally visited and asked to make any further needed changes in the list of skills. The list of skills was restricted to those performed with the animal, such as ear tagging, castration, and vaccination. As a result, 13 swine, 17 general cattle, 8 dairy, and 15 sheep skills were identified for use in the study.

Data were collected via a mailed questionnaire. The instrument was field tested for clarity and then pilot tested. Reliability was assessed using the test-retest procedure to determine stability of responses. A coefficient of $r = .98$ was derived from the test-retest pilot data.

The instrument was compiled in booklet fashion and mailed to a random sample of 100 agricultural production teachers, which represented approximately 31 percent of the target population. Instrument distribution consisted of the initial mailing, a postcard follow-up reminder, and two additional follow-up letters containing replacement questionnaires.

A total of 90 questionnaires were returned. However, four were received after the established deadline, and an additional four were not usable due to partial completion. Thus, the data sample consisted of 82 questionnaires of 82 percent of the sample. Data were collected in person from a 20 percent random sample of nonrespondents for the purpose of examining possible differences between respondent and nonrespondent groups. Analysis showed no significant differences between the two groups, thus allowing generalization of the results to the target population under study.

Descriptive statistics were used to summarize and analyze the data.

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

For each of the 53 livestock skills, teachers were asked to indicate the number of times they had taught the skill during the past school year. In addition, for those skills they had taught, teachers were asked to report the teaching methods used. These included discussion only, discussion with models, demonstration with the live animal, and student practice in performing the skill. If teachers circled more than one method, only the highest method indicated (with "discussion only" as the lowest and "student practice" as the highest) was utilized by the researcher to analyze skill teaching method.

Teaching Methods Used for Livestock Skill Instruction

The number of teachers who reported that they had provided skill instruction varied ~~considerably~~ from skill to skill. However, for the set of 13 swine skills the mean percentage of teachers who did not teach each skill was nearly 32 percent (see Table 1). Another one-third taught the skills using discussion only. Thus, nearly one-half of those who taught the skill did so using "discussion only" as their teaching method. Swine skills were taught with demonstrations by an average of 11.8 percent of the teachers. Less than 15 percent of all teachers and only one in five teachers (21.6 percent) who taught the swine skill provided for student practice.

Similar results were found for the set of general cattle skills (see Table 2), where an average of nearly one-third (29.7 percent) of the teachers reported they did not teach the specified skill. In addition, four of every ten teachers (or nearly six in ten of those who taught the skill) indicated they used "discussion only" as their teaching method. An average of about 10 percent used demonstrations, and less than one teacher in ten provided student practice of the specified skill.

For the set of dairy skills, an average of over one-half (55.4 percent) of the teachers reported they did not teach the skill (see Table 3). Another one-third (34.3 percent) reported using discussion only or discussion with models as their primary teaching technique. Less than one in thirteen teachers who taught the skill provided for student practice. Demonstrations were reportedly used by an average of 6.4 percent of all teachers.

For the set of sheep skills an average of four in ten teachers reported they did not teach the specified skill (see Table 4). Almost another one-third of all teachers (and over one-half of those who taught the skill) used "discussion only" as their primary method. For all teachers an average of less than 20 percent taught sheep skills using demonstrations and/or providing for student practice of the skill.

A summary of the teaching methods used is provided in Table 5, which reveals that over one-half of the teachers who provided livestock skill instruction did so using discussion only. Furthermore, Table 5 indicates that seven of every ten teachers who taught livestock skills used either discussion or discussion with models as their teaching method.

Correlational Findings

Teachers in the study were asked to report their self-perceived importance of each livestock species in their teaching community. They also indicated if they had taught any lessons dealing with each species during the past year. The relationship between perceived importance of the species and the teaching of lessons dealing with that species was examined using the Phi coefficient. Results indicated a substantial relationship (r = .52) between the perceived importance of cattle to the community and the teaching of lessons dealing with beef and dairy production. A moderate degree of association (r = .33) was found between the teacher rating of the importance of swine and the teaching of swine lessons. Finally, teachers who rated sheep as important had a low tendency (r = .26) to teach lessons in sheep production.

Table 1

Frequency and Percentage of Teaching Method Used by Swine Skill

Swine Skill	Teaching Method Used											
	Did Not Teach		Discussion Only		Discussion With Models		Demonstration With Live Animal		Students Practiced		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. ear notch pigs	15	19.0	22	27.8	14	17.7	11	13.9	17	21.5	79	100.0
2. ear tag	24	30.8	23	29.5	9	11.5	11	14.1	11	14.1	78	100.0
3. clip tails	21	26.9	23	29.5	8	10.3	13	16.7	13	16.7	78	100.0
4. clip needle teeth	14	18.2	25	32.5	9	11.7	15	19.5	14	18.2	77	100.0
5. de-tusk boars	60	76.9	15	19.2	1	1.3	2	2.6	0	0.0	78	100.0
6. ring	31	40.3	26	33.8	4	5.2	7	9.1	9	11.7	77	100.0
7. castrate	12	15.4	21	26.9	9	11.5	15	19.2	21	26.9	78	100.0
8. give injections	18	23.1	20	25.6	9	11.5	15	19.2	16	20.5	78	100.0
9. artificially inseminate	37	48.1	28	36.4	8	10.4	2	2.6	2	2.6	77	100.0
10. probe backfat	43	55.1	29	37.2	4	5.1	1	1.3	1	1.3	78	100.0
11. treat for internal parasites	16	20.5	39	50.0	6	7.7	6	7.7	11	14.1	78	100.0
12. treat for external parasites	15	19.2	36	46.2	8	10.3	7	9.0	12	15.4	78	100.0
13. fit and show	18	23.1	16	20.5	8	[illegible]0.3	15	19.2	21	26.9	78	100.0
$\overline{X}$	24.8	31.9	24.8	31.8	7.5	9.6	9.2	11.8	11.4	14.6		

Table 2

Frequency and Percentage of Teaching Method Used by General Cattle Skill

	Teaching Method Used											
	Did Not Teach		Discussion Only		Discussion With Models		Demonstration With Live Animal		Students Practiced		Total	
Beef and Dairy Skill	f	%	f	%	f	%	f	%	f	%	f	%
1. treat for internal parasites	12	15.0	45	56.3	11	13.7	7	8.7	5	6.3	80	100.0
2. treat for external parasites	12	15.0	42	52.5	10	12.5	10	12.5	6	7.5	80	100.0
3. trim hooves	35	43.8	21	26.2	7	8.7	8	10.0	9	11.2	80	100.0
4. ear tag	19	23.7	18	35.0	13	16.2	9	11.2	11	13.7	80	100.0
5. tattoo	35	44.3	28	35.4	6	7.6	8	10.1	2	2.5	79	100.0
6. brand	40	50.0	28	35.0	2	2.5	6	7.5	4	5.0	80	100.0
7. treat navel cord	18	22.5	40	50.0	7	8.7	6	7.5	9	11.2	80	100.0
8. treat for bloat	24	30.0	42	52.5	7	8.7	5	6.3	2	2.5	80	100.0
9. check temperature	37	46.2	31	38.7	5	6.3	3	3.7	4	5.0	80	100.0
10. assist in calving	19	23.7	40	50.0	11	13.7	6	7.5	4	5.0	80	100.0
11. vaccinate	20	25.3	36	45.6	8	10.1	10	12.7	5	6.3	79	100.0
12. dehorn	21	26.6	35	44.3	11	13.9	6	7.6	6	7.6	79	100.0
13. castrate	14	17.7	30	38.0	13	16.5	9	11.4	13	16.5	79	100.0
14. artificially inseminate	22	27.8	36	45.6	11	13.9	8	10.1	2	2.5	79	100.0
15. palpate	42	53.2	27	34.2	5	6.3	5	6.3	0	0.0	79	100.0
16. implant growth stimulant	22	28.2	32	41.0	7	9.0	7	9.0	10	12.8	78	100.0
17. fit and show beef	12	15.2	28	35.4	3	3.8	15	19.0	21	26.6	79	100.0
$\bar{x}$	23.76	29.7	32.88	41.1	8.06	10.1	7.53	9.4	6.65	8.4		

Table 3

Frequency and Percentage of Teaching Method Used by Dairy Cattle Skill

	Teaching Method Used											
	Did Not Teach		Discussion Only		Discussion With Models		Demonstration With Live Animal		Students Practiced		Total	
Dairy Cattle Only	f	%	f	%	f	%	f	%	f	%	f	%
1. treat calves for scours	21	27.3	42	54.5	6	7.8	5	6.5	3	3.9	77	100.0
2. draw milk samples	53	68.8	15	19.5	4	5.2	3	3.9	2	2.6	77	100.0
3. dry treat cows	52	67.5	18	23.4	4	5.2	3	3.9	0	0.0	77	100.0
4. install heat detectors	52	66.7	21	26.9	3	3.8	[illegible]	2.6	0	0.0	78	100.0
5. administer California mastitis test	66	84.6	7	9.0	2	2.6	1	1.3	2	2.6	78	100.0
6. treat for mastitis	37	47.4	30	38.5	6	7.7	5	6.[illegible]	0	0.0	78	100.0
7. use proper milking techniques	38	48.7	19	24.4	9	11.5	10	12.8	2	2.6	78	100.0
8. fit and show	27	34.6	24	30.8	4	5.1	11	14.1	12	15.4	78	100.0
$\bar{x}$	43.25	55.4	22.00	28.2	4.75	6.1	5.00	6.4	2.63	3.4		

Table 4

Frequency and Percentage of Teaching Method Used By Sheep Skill

	Teaching Method Used											
	Did Not Teach		Discussion Only		Discussion With Models		Demonstration With Live Animal		Students Practiced		Total	
Sheep Skill	f	%	f	%	f	%	f	%	f	%	f	%
1. trim feet	34	46.6	17	23.3	3	4.1	11	15.1	8	11.0	73	100.0
2. treat for foot rot	40	50.0	33	41.2	1	1.2	4	5.0	2	2.5	80	100.0
3. ear tag	33	42.3	23	29.5	6	10.3	9	11.5	5	6.4	78	100.0
4. check temperature	48	60.8	21	26.6	3	3.8	3	3.8	4	5.1	79	100.0
5. treat navel cord	33	42.3	29	37.2	6	7.7	4	5.1	6	7.7	78	100.0
6. vaccinate	30	38.5	28	35.9	7	9.0	6	7.7	7	9.0	78	100.0
7. castrate	20	25.6	26	33.3	6	7.7	13	16.7	12	15.4	78	100.0
8. dock lambs	21	26.9	25	32.1	6	7.7	13	16.7	13	16.7	78	100.0
9. assist in lambing	32	40.5	36	45.6	5	6.3	2	2.5	4	5.1	79	100.0
10. shear	45	57.0	13	16.5	6	7.6	10	12.7	5	6.3	79	100.0
11. tag and crutch ewes	49	62.0	15	19.0	4	5.1	6	7.6	5	6.3	79	100.0
12. treat for parasites by drenching	33	42.3	29	37.2	8	10.3	4	5.1	4	5.1	78	100.0
13. treat for parasites with boluses	39	50.0	23	29.5	4	5.1	7	9.0	5	6.4	78	100.0
14. treat for parasites by dipping	31	39.7	35	44.9	7	9.0	3	3.8	2	2.6	78	100.0
15. fit and show	25	32.1	20	25.6	5	6.4	13	16.7	15	19.2	78	100.0
$\bar{x}$	34.20	43.8	24.87	31.9	5.13	6.6	7.2	9.2	6.47	8.3		

Table 5

Average Percentage of Teaching Method Used By Livestock Species

	Teaching Method Used									
	Did Not Teach %		Discussion Only %		Discussion With Models %		Demonstration %		Student Practice %	
Species	A*	B**	A	B	A	B	A	B	A	B
1. swine	31.9	---	31.8	46.9	9.6	14.2	11.8	17.4	14.6	21.6
2. general cattle	29.7	---	41.1	59.7	10.1	14.6	9.4	13.7	3.9	12.1
3. dairy	55.4	---	28.2	64.0	6.1	13.8	6.4	14.5	3.4	7.6
4. sheep	43.8	---	31.9	56.9	6.6	11.7	9.2	16.5	8.3	14.8
$\bar{X}$	40.2	---	33.3	56.9	8.1	13.6	9.2	15.5	7.6	14.0

* Includes all teachers

** Includes only teachers who taught the skill

The relationship between livestock lessons taught in general and livestock skills taught was examined using the Pearson correlation coefficient. A substantial relationship (r = .55, $p < .001$) was found between sheep lessons taught and the number of sheep skills taught. This result indicated that teachers who taught lessons in sheep production tended to make instruction in sheep skills a component of that instruction. The relationship between lessons taught and skills taught was found to be moderate (r = .38, $p < .001$) for swine and negligible (r = .05) for cattle.

The relationship between years of teaching experience and the frequency and methods of teaching livestock skills was examined using the Pearson correlation coefficient (see Table 6).

Table 6

Pearson Correlation of Years of Teaching Experience
By Frequency and Methods of Livestock
Skill Instruction

		Frequency	Methods
1.	swine	.24*	.10
2.	beef	.22*	.16
3.	dairy	.17	.18
4.	general cattle	.23*	.17
5.	sheep	.25*	.10
6.	overall	.26*	.16

*$p < .05$

Table 6 reveals negligible relationships in all cases between years of teaching experience and methods used to teach livestock skills. Except for dairy skills, a low relationship was found in all cases between years of teaching experience and the number of times livestock skills were taught. This finding indicated a slight tendency for teachers with more experience to teach a greater number of livestock skills.

Conclusions

Based upon the results of this study, the following conclusions were drawn:

1. Agricultural production teachers in Ohio tend to teach lessons in the livestock production areas that they perceive as important in their school community.

2. Relatively low emphasis is given to livestock skill development as a part of the overall instruction provided in livestock production.
3. Ohio teachers tend to use discussion as their primary method of teaching livestock skills. A relatively small percentage of livestock skill instruction includes skill demonstration and student practice at performing the skill.
4. There is no relationship between the methods used by Ohio teachers to teach livestock skills and the number of years of vocational agriculture teaching experience possessed. However, there is a slight tendency for the more experienced teachers to teach livestock skills more often than teachers with fewer years of teaching experience.

Recommendations

The results of this study supported the limited research that had been done in the area of methods used in livestock skill instruction. These results implied that Ohio agricultural production teachers were very hesitant to include skill demonstrations or student practice as a part of their efforts to teach livestock skills. Furthermore, this hesitancy did not appear to be related to the years of experience a vocational agriculture teacher had accumulated. There appeared to be a general lack of emphasis on skill development and a specific lack of opportunity provided for students to practice and develop skill mastery. Instead students enrolled in Ohio agricultural production programs tended to receive secondhand instruction and experience in performing essential skills in livestock production. That is, teachers appeared to be "teaching about" these skills, rather than teaching their students to actually perform them.

Based upon the results obtained and conclusions drawn in the study, the following recommendations were forwarded:

1. Agricultural production teachers in Ohio should organize their instruction in livestock production around those species that are important and of interest to their students and community.
2. Instruction provided in livestock production should include student practice at performing pertinent manipulative skills. Teachers should use a variety of teaching methods or techniques in livestock skill instruction. Greater emphasis should be placed on developing skill competence through the use of demonstrations and actual student practice.
3. Inservice education programs that assist teachers in planning and providing livestock skill instruction should be offered in formal and informal (workshop) settings.

The outcomes of this study helped to highlight the need for additional research in related areas, such as:

(1) an identification of the levels of skill development acquired by students completing agricultural production programs,
(2) an identification of factors teachers use to determine their methods of skill instruction,
(3) an examination of the objectives of agricultural production programs in the skill areas,
(4) the effects of inservice education efforts on the teaching of livestock skills, and
(5) a replication of this study in other geographical areas with attention given to teaching methods, as well as levels of teacher competence and confidence in performing livestock skills.

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TIME-ON-TASK BEHAVIOR OF PUPILS ENROLLED IN VOCATIONAL HORTICULTURE LABORATORIES

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INTRODUCTION/NEED FOR THE STUDY

The use of time in schools is a central variable in learning (Bloom, 1974; Carroll, 1963) and a major factor for understanding classroom effectiveness (Frederick & Walberg, 1980). Establishing a relationship between time spent in learning and pupil achievement has been an objective of several recent studies (Anderson, 1980; Gambrell, Wilson, & Gantt, 1981; Sanford & Evertson, 1982; Tobin & Capie, 1981). Results indicate that there is a positive correlation between the amount of time the learner engages in a learning task (i.e., time on task) and gains in learner achievement.

Classroom time is a valuable resource and how available time is utilized and scheduled will affect learning outcomes (Martin & Canty, 1980). One of the intended outcomes of vocational agriculture programs is the acquisition of competencies needed by individuals preparing for agricultural occupations. If pupils enrolled in vocational agriculture are to acquire occupational competencies, they must have an opportunity to actively engage in skill development tasks. The in-school vocational laboratory period is one of the ways in which time is provided for learning and practicing agricultural skills. The systematic observation of laboratory procedures can provide quantitative data on how laboratory time is used to develop the competencies needed by agricultural workers.

Although several studies have been conducted in recent years to define, measure, and explain pupil time-on-task behavior, little research has been conducted that specifically studies time-on-task behavior at the secondary level in a nonclassroom setting involving both cognitive and motor skill learning tasks. The purpose of this study was to investigate time-on-task behavior in a laboratory environment. More specifically, the study was designed to quantify the laboratory time-on-task behavior of pupils enrolled in selected programs of vocational horticulture and to identify pupil and situational variables that may be related to time on task.

OBJECTIVES FOR THE STUDY

Following a review of related research, three objectives were formulated:

1. to quantify the time-on-task behavior of pupils enrolled in selected programs of vocational horticulture;

2. to determine the relationship between the pupil variables of gender, scholastic achievement, attitude, and career goal and pupil time-on-task behavior; and
3. to determine the relationship between the situational variables of laboratory management practices, teacher supervision, and level of task difficulty and pupil time-on-task behavior.

METHODS AND PROCEDURES

A descriptive analytic study was conducted using direct observational techniques to investigate pupil time-on-task behavior in vocational horticulture laboratories. The investigation was designed to describe relationships between variables; the establishment of cause and effect was not intended.

There are several biases of observational research that are inherent in the subject and observer. Efforts were made to recognize and reduce these weaknesses in methodological design. The Hawthorne effect was minimized by not informing the pupils and instructors of the exact nature of the study, by not allowing the subjects to be aware of the time when pupil behavior was being recorded, and by recording observations on three different occasions. Bias due to demand characteristics was reduced because subjects were not asked to assume a role that deviated from their usual role as a pupil in a vocational horticulture class. The halo effect was minimized by clearly defining the behavior to be observed. Time on task was coded as specific, overt, low-inference behavior such as watering plants and planting ornamental shrubs. Experimenter bias was reduced by keeping to a minimum direct observer-subject interaction, by recording laboratory behavior prior to gathering data on other variables of interest, and by avoiding the recording of high inference, abstract behavior.

The sample consisted of pupils enrolled in programs of vocational horticulture at purposely selected secondary vocational centers in Mississippi. Subjects were obtained from available intact groups and were not randomly selected from the accessible population of students. Therefore, inference and generalizations to a larger population were not made. The sampling plan resulted in 49 pupils being observed in five classes at four different vocational centers.

A categorization system was constructed to classify the different types of pupil responses to teacher-prescribed laboratory activities. The following categories were employed to classify pupil response:

1. Time on task - the laboratory instructional time in which the pupil is actively engaged in a horticultural learning task, e.g., transplanting bedding plants, sowing tomato seeds, or applying fungicides.
2. Time off task - the laboratory instructional time in which the pupil is engaged in activities unrelated to time-on-task

skill development, e.g., leaving assigned area, misbehaving, or working on an unprescribed task.

3. No task opportunity - the laboratory instructional time in which the pupil is unable to practice horticultural learning tasks, e.g., participating in other school activities, being absent from school, or having no prescribed activity.

The Laboratory Observation Form was developed specifically for use in the study. This form was an adaptation of the observational schedule developed by Karweit and Slavin (1981) for use in elementary classrooms. Instrument refinement was gained by conducting a three-day field study in a secondary horticulture class not in the study. The Survey of Pupil Opinion (Kilbane, 1972), was used to measure the variable of pupil attitude. The instrument was validated in Mississippi among average and below average vocational pupils and yielded a reliability coefficient of r = .82. The Pupil Information and Code Sheets were developed to collect data pertaining to the selected pupil variables. The cognitive and psychomotor level of each laboratory activity was ranked by a panel of experts according to the classification systems developed by Bloom (1956) and Harrow (1972).

Data were collected by direct observation of pupil behavior within the selected vocational horticulture laboratories. The unit of behavior observed and measured was the amount of time in which the pupil was actively engaged in a horticultural learning task. Point-sampling procedures were used to secure a representative sample of pupil time-on-task behavior. The observer looked at each pupil just long enough to decide what he or she was doing. The appropriate symbol was marked on the observation form, and the process was repeated for each pupil enrolled in the horticulture class. A minimum of 12 observations per pupil were obtained per visit.

Three consecutive observational visits per horticulture class were conducted during the second semester of the 1983 school year. The observer stayed in the classroom during the entire class time allocated for vocational horticulture, but only recorded observations during the laboratory instructional time. Observations of pupil time-on-task behavior were made by the same observer at each center in the study. The observer was present in the five horticulture classrooms a total of 30 hours and 50 minutes during the four-week data collection period. Twelve and a half hours were used to record 2,868 observations. During data collection 8,239 separate pieces of information were coded by the observer.

RESULTS: FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Findings

Five horticulture classes at four different vocational centers participated in the study. Each vocational center had a fiberglass greenhouse and land laboratory for horticulture laboratory instructional purposes. Four male vocational instructors participated in the study. The number of years in the teaching profession ranged from one year to 25 years. Usable data were collected from 47 of the 49 pupils participating in the study. Sixty-six percent of the pupils were black and 34% were white. Twenty-four of the pupils were male and 23 were female. Ninety-two percent of the pupils had no prior horticulture experience. This category included participation in FFA horticulture events and supervised occupational experience programs and work experience in the horticulture industry.

Allocated class time averaged 96 minutes per day among the five vocational classes. An average of 31% of allocated class time involved procedural activities. Activities occurring during procedural time included taking attendance, reviewing laboratory assignments, discussing student organization activities, taking school-prescribed breaks, delivering classroom lectures, and listening to school announcements. An average of 65% of allocated class time was used to provide pupils an opportunity to practice horticultural learning tasks. The amount of unaccounted time due to observer error averaged five minutes per observational visit.

The type of teacher supervision occurring during laboratory instructional time was recorded during observational visits. An average of 52% of the total observational time involved either direct or indirect teacher supervision and 48% of the observational time involved no teacher supervision. The differences among the five vocational classes regarding the level of teacher supervision varied greatly. In one vocational class, pupils were not within the visual range of the teacher for 74% of the total observational time and in another vocational class, pupils were not within the visual range of the teacher for 16% of the observational time.

Thirty-one different horticultural learning tasks were identified during the 15 observational visits. Ninety percent of the tasks performed during observational time were classified as requiring low level cognitive abilities and 5% required high level abilities. High level cognitive tasks included troubleshooting plant problems and helping customers with plant selection. Low level cognitive tasks included weeding hanging baskets and moving plants. Eighty-four percent of the tasks involved basic body movement and 16% of the tasks required skilled movement. Learning tasks requiring skilled body coordination included sowing seeds and propagating plants. Tasks involving basic body movement included transplanting shrubs and mixing rooting media.

Figure 1 illustrates that pupils were on task for an average of 71% of the total observational time and were off task for an average of 29% of the observational time. Pupil time on task ranged from 92% to 56% of the total observational time among the five horticulture classes. As shown in Table 1, standing idle was the most frequent reason for coding pupil behavior as off task, accounting for 13% of the total observational time. When calculating individual time-on-task scores, observations coded "no task opportunity" were deleted. The removal of these 493 observations resulted in a base of 2,375 observations for the calculation of individual time-on-task scores. Pupil time-on-task scores were calculated as a proportion of the total number of observations (N = 2,375) and ranged from 13% to 100% time on task. The average time-on-task score for all pupils was 71%.

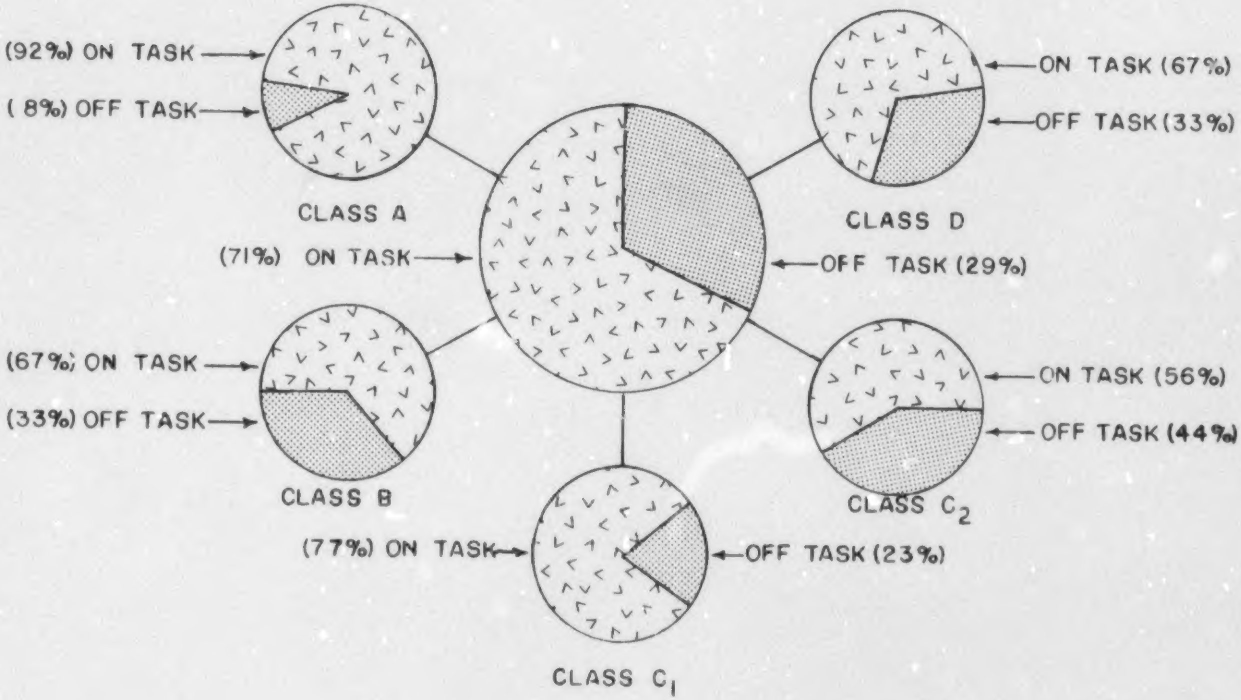

Figure 1

Pupil Response During
Laboratory Instructional Time

Table 1

Percent of Observational Time Due to Time-off-Task Behavior[a]

Category of Time-off-Task Behavior	Vocational Class					Total Group
	A	B	C_1	C_2	D	
Leaving lab area; wandering around	40	32	19	17	16	22
Teacher errand or activity	26	53	2	2	6	17
Standing idle	0	15	69	44	69	46
Misbehaving	0	0	10	1	9	4
Observing other pupils	34	0	0	36	0	11
Total	100	100	100	100	100	100

[a] n = 678 observations.

There were negligible correlations between time-on-task scores and the pupil variables of scholastic achievement, attitude, and career goal. The coefficient for gender ($r = -.47$) revealed a statistically significant correlation ($\underline{p} < .001$) indicating that male pupils tended to have higher time-on-task scores than female pupils. The average time-on-task score was 81% for male pupils and 60% for female pupils.

There were low correlation coefficients between time-on-task behavior and learning tasks categorized in five of the six levels of the cognitive domain and in three of the four levels of the psychomotor domain. The low coefficients indicate that the cognitive and psychomotor level of the task tended to be independent of time-on-task behavior.

Table 2 shows the multiple correlation coefficient of $r = .75$ indicating that five variables explained 57% of the variance in the dependent variable of time on task. Direct supervision explained 28% of the variance; pupil gender explained an additional 16%; indirect and no teacher supervision collectively explained 10%; and laboratory management practices explained less than one percent of the variance in time-on-task scores.

Table 2

Regression of Time on Task on Gender, Teacher Supervision, and Laboratory Management Practices

Variable	Multiple R	R^2	R^2 Change
Direct Supervision	.533	.284	.284
Gender	.670	.449	.165
Indirect Supervision	.731	.535	.085
No Supervision	.750	.562	.027
Laboratory Management Practices	.755	.570	.007

Conclusions

The vocational centers, horticulture classes, instructors, and pupils selected to participate in the study were not a representative sample from the accessible population. Subjects were obtained from available intact groups. The three consecutive days of observations represent a narrow segment of pupil behavior throughout an entire school year. Within these parameters caution must be taken in applying the research findings to similar groups and going from a descriptive study to a prescriptive one. The following conclusions are based on the interpretation of the data analysis and are limited to the particular subjects studied:

1. An increase in laboratory instructional time does not always correspond with an increase in time-on-task behavior.
2. The variables of scholastic achievement, career goal, pupil attitude, and level of task difficulty are independent of time-on-task behavior during laboratory instructional time.
3. Male pupils are on task more frequently than female pupils.
4. Direct and indirect teacher supervision increase pupil time-on-task behavior and no teacher supervision decreases pupil time-on-task behavior.
5. Although high level cognitive tasks represent only five percent of the recorded observations, these tasks tend to correspond with high time-on-task scores.
6. Teacher variables of supervision and laboratory managment practices explain a greater proportion of the variance in time-on-task scores as compared to pupil variables.

Recommendations

The following recommendations for additional research are made on the basis of the findings of the study and on the recorded observations:

1. Research involving randomly selected pupils, teachers, and/or schools should be conducted to increase the generalizability of the present research findings.
2. Variables associated with time on task should be studied in experimental settings to determine the exact nature of time-on-task behavior in a laboratory environment. Experimental findings can be used to develop a profile of variables associated with time-on-task behavior. This profile of related variables could assist teachers in organizing and selecting laboratory learning tasks.
3. A strictly quantitative description of time on task does not provide the needed information concerning the qualitative aspects of pupil on-task behavior. Studies are needed that use qualitative definitions of time on task.

4. The vocational teacher plays an important role in organizing class time for the practice of specific learning tasks. Allocating more time for laboratory instruction does not necessarily mean more learning will occur. Additional research is needed to determine the amount of time required to attain an acceptable level of competence in performing horticultural tasks.
5. Research efforts studying other pupil, instructor, and situational variables will help to account for the unexplained variance in time-on-task behavior.
6. Replications of the study in other vocational agriculture classes would provide additional verification of the findings.

The following recommendations are specifically directed to the vocational classes in the study. However, the recommendations may be considered by other horticulture classes in similar settings.

1. An apparent lack of teacher supervision may indicate a misunderstanding among the instructors of the purpose for laboratory instructional time. Additional preservice or inservice education by teacher educators and follow-up visits by state supervisors may overcome this misunderstanding by emphasizing the importance of teacher-directed laboratory instruction.
2. Both male and female pupils need to be involved in all aspects of laboratory instruction.
3. Although pupils were on task 71% of the total observational time, the majority of the tasks required low level cognitive skills and did not appear to be linked to specific instructional objectives. Instructors need to provide a variety of laboratory learning activities that require both high- and low-level cognitive skills. The daily recording of laboratory activities may help instructors and pupils to link task performance to specific occupational competencies.

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SAMPLE SIZE FOR SURVEY RESEARCH: HAVE YOU CONSIDERED THE TYPE II ERROR?*

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In a previous article, the authors included the Type II error as a factor in determining the sample size (Hinkle & Oliver, in press). Tables, showing sample sizes under various assumptions, were developed for one-factor designs with k levels ($2 \leq k \leq 8$). These tables cannot be used to determine sample sizes for single group surveys or estimation studies. As a result, colleagues have asked if tables are available which consider the Type II error in determining the sample size for the one-sample case. The answer is that simple, straightforward tables of that type are not available. The purpose of this paper is to address the sample size question and present tables which hopefully will meet the need expressed by colleagues.

SAMPLING METHODS COMMONLY USED

Formulas reported by Cochran (1963) and Krejcie and Morgan (1970) have been widely used for the one-sample case. The factors necessary to use these formulas are:

1. the population size (N),
2. the level of significance (α),
3. the population error variance (σ^2), and
4. the degree of accuracy (d).

Krejcie and Morgan (1970) included a table for determining the sample size and reported that it "is applicable to any defined population" (p. 607). It does not, as the above factors reveal, include consideration of the Type II error (β). It should be noted that use of the Krejcie and Morgan table requires the assumption that the size of the population is known and the response measure is dichotomous. It appears the table is being used while violating either or both of these assumptions.

Another concern of critical importance is that faculty and graduate students appear to be using the Krejcie and Morgan table with little consideration being given to the value used for d, the degree of accuracy. Krejcie and Morgan (1970) used $d = .05$ (p. 607) which hardly seems appropriate for use in every situation. It is recommended that d be carefully selected and that justification be provided for the level selected.

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SAMPLE SIZE AND THE TYPE II ERROR

The methods discussed above considered only the probability of committing a Type I error (α). Cohen (1962, 1965, and 1969) has taken the lead in emphasizing that the probability of committing a Type II error (β) is of equal importance. Actually, he has concerned himself with the power of the statistical test (1 - β) which is the probability that the test will lead to the rejection of the null hypothesis.

In discussing power analysis, Cohen (1969) indicated that the power of a statistical test is a function of:

1. the level of significance (α),
2. the estimated variance of the criterion variable (σ^2),
3. the sample size (*n*), and
4. the effect size (*ES*).

The effect size is "the degree to which the phenomenon exists" (Cohen 1969, p. 9) and is analogous to the degree of accuracy (*d*) in the Cochran (1963) and Krejcie and Morgan (1970) formulas. Given the relationship between power and the above factors, sample size is a function of:

1. the level of significance (α),
2. the power of the statistical test (1-β),
3. the estimated variance of the criterion variable (σ^2), and
4. the effect size (*ES*).

Agricultural educators can specify the level of significance and the power of the statistical test; the estimated variance can be determined from the literature or a pilot test. The effect size cannot be easily specified. Efforts have been made to define and standardize effect size in determining sample size (Cochran, 1963; Cohen, 1969; Elliott, 1980; Feldt, 1973) but the results have not been conclusive.

TABLES FOR DETERMINING SAMPLE SIZE

The authors have developed a set of tables which provide a solution to the sample size question once the effect size question has been resolved. The tables were developed using the following formula discussed by Guilford and Fruchter (1978, p. 185):

$$n_i = \frac{\sigma^2 (t_\beta - t_\alpha)^2}{d^2}$$

where:

n_i = the required sample size for an infinite population

σ^2 = the population error variance

t_β = table value of t for the chosen level of β

t_α = table value of t for the chosen level of α

d = the effect size or the degree of accuracy

In developing Tables 1 and 2, the unit normal curve was used; Tables 3 and 4 were developed using the Student's *t* distribution corrected for the appropriate degrees of freedom. These tables are applicable to the one-sample case with simple random sampling. If the number of samples is two or more, the sample size may be determined from Hinkle and Oliver (in press).

Tables 1 and 2 provide the sample sizes when sampling for proportions. Sample sizes are shown for one- or two-tailed tests for the following values:

1. level of significance (.05, .01),
2. power of the statistical test (.75, .80, .85, .90, .95, .99),
3. estimated variance (population proportion assumed to be .50 which gives the maximum variance), and
4. effect size expressed as a proportion in terms of actual differences (*d* from .01 to .50) and expressed in standard deviation units (*ES* from .02 to 1.00).

The effect size is the acceptable difference between the sample proportion and the population proportion. The implication is that a difference larger than the effect size would be needed in order for the rejection of the null hypothesis to be both statistically significant and practically important.

Tables 3 and 4 provide the appropriate sample sizes when interval data are involved. The tables provide for one- or two-tailed tests for the following values:

1. level of significance (.05, .01),
2. power of the statistical test (.75, .80, .85, .90, .95, .99),
3. estimated variance--standardized in the effect size, and
4. effect size defined in terms of standard deviation units (*ES* from .10 to 1.50).

The effect size is the acceptable difference between the sample mean and the population mean expressed in standard deviation units. For example, if previous studies have shown a standard deviation of 16 points and it has been found that a difference of 8 is of major importance, the effect size would be set at $.50\sigma$. This implies that a difference larger than one-half of a standard deviation would be needed in order for the rejection of the null hypothesis to be both statistically significant and practically important.

To illustrate the use of the tables, suppose one desires to determine whether farmers do or do not favor a proposed government program. Since this is a dichotomous response measure, either Table 1 or 2 must be used. The decision is made to use a two-tailed test with $\alpha = .01$, power = .80 and $d = .10$. Referring to Table 2, the required sample size is 292.

For another example, suppose one desires to determine the number of beef cows on farms in a given state. Previous studies have shown a standard deviation of 10 cows and it is felt that a difference of 5 cows ($d = .50\sigma$) is an important one. A two-tailed test will be used

Table 1

Sample Sizes for Proportions Using One-Tailed Tests With Varying Effect Sizes and Levels of Power

		α = .05					
		Power of the statistical test					
d	*ES*	.75	.80	.85	.90	.95	.99
.01	.02	13,450	15,457	17,974	21,412	27,057	39,426
.02	.04	3,363	3,865	4,493	5,353	6,765	9,857
.04	.08	841	967	1,124	1,339	1,692	2,465
.05	.10	538	619	719	857	1,083	1,577
.06	.12	374	430	500	595	752	1,096
.08	.16	211	242	281	335	423	616
.10	.20	135	155	180	215	271	395
.15	.30	60	69	80	96	121	176
.20	.40	34	39	45	54	68	99
.25	.50	22	25	29	35	44	64
.50	1.00	6	7	8	9	11	16
		α = .01					
.01	.02	22,512	25,089	28,270	32,543	39,426	54,117
.02	.04	5,628	6,272	7,068	8,136	9,857	13,530
.04	.08	1,407	1,568	1,767	2,034	2,465	3,383
.05	.10	901	1,004	1,131	1,302	1,577	2,165
.06	.12	626	697	786	904	1,096	1,504
.08	.16	352	393	442	509	616	846
.10	.20	226	251	283	326	395	542
.15	.30	100	112	126	145	176	241
.20	.40	57	63	71	82	99	136
.25	.50	36	41	46	53	64	87
.50	1.00	9	10	12	14	16	22

Table 2

Sample Sizes for Proportions Using Two-Tailed Tests With Varying Effect Sizes and Levels of Power

		α = .05					
		Power of the statistical test					
d	*ES*	.75	.80	.85	.90	.95	.99
.01	.02	17,352	19,623	22,447	26,270	32,488	45,930
.02	.04	4,338	4,905	5,612	6,568	8,123	11,483
.04	.08	1,085	1,227	1,403	1,642	2,031	2,871
.05	.10	695	785	898	1,051	1,300	1,838
.06	.12	482	546	624	730	903	1,276
.08	.16	272	307	351	411	508	718
.10	.20	174	197	225	263	325	460
.15	.30	78	88	100	117	145	205
.20	.40	44	50	57	66	82	115
.25	.50	28	32	36	42	52	74
.50	1.00	7	8	9	11	13	19
		α = .01					
.01	.02	26,412	29,197	32,620	37,199	44,536	60,076
.02	.04	6,603	7,300	8,155	9,300	11,134	15,020
.04	.08	1,651	1,825	2,039	2,325	2,784	3,755
.05	.10	1,057	1,168	1,305	1,488	1,782	2,403
.06	.12	734	811	907	1,034	1,238	1,669
.08	.16	413	457	510	582	696	939
.10	.20	265	292	327	372	446	601
.15	.30	118	130	145	166	198	267
.20	.40	66	73	82	93	112	151
.25	.50	43	47	53	60	73	97
.50	1.00	11	12	14	15	18	25

Table 3

Sample Sizes for Interval Data Using One-Tailed Tests With Varying Effect Sizes and Levels of Power

	$\alpha = .05$					
	Power of the statistical test					
ES	.75	.80	.85	.90	.95	.99
.10	538	619	719	857	1,083	1,577
.20	135	155	180	215	271	395
.30	62	71	82	98	121	176
.40	35	41	47	56	70	103
.50	23	27	31	37	45	66
.60	17	20	23	26	32	46
.70	13	15	18	21	24	35
.75	12	13	15	19	21	31
.80	11	12	14	17	19	28
.90	9	10	11	13	16	22
1.00	8	9	10	11	13	19
1.25	6	7	7	8	10	14
1.50	6	6	6	7	9	11
	$\alpha = .01$					
.10	901	1,004	1,131	1,302	1,577	2,165
.20	226	251	283	326	395	542
.30	101	112	126	145	176	241
.40	59	66	74	85	103	136
.50	39	43	48	55	66	91
.60	28	30	34	39	46	64
.70	21	23	26	29	35	48
.75	19	21	23	26	31	42
.80	17	19	21	23	27	37
.90	14	16	17	19	22	30
1.00	13	14	15	16	19	25
1.25	11	11	12	12	13	18
1.50	9	10	10	10	11	14

Table 4

Sample Sizes for Interval Data Using Two-Tailed Tests With Varying Effect Sizes and Levels of Power

	α = .05					
	Power of the statistical test					
ES	.75	.80	.85	.90	.95	.99
.10	695	785	898	1,051	1,300	1,838
.20	174	197	225	263	325	459
.30	80	90	103	117	145	205
.40	46	52	58	68	84	119
.50	30	34	38	44	54	77
.60	22	24	27	32	38	54
.70	17	19	21	24	29	40
.75	15	16	18	21	26	36
.80	13	15	16	19	23	32
.90	11	12	14	15	19	26
1.00	10	11	12	13	16	22
1.25	8	9	9	10	11	15
1.50	7	8	9	9	10	12
	α = .01					
.10	1,057	1.168	1,305	1,488	1.782	2,404
.20	265	292	327	372	446	601
.30	118	130	145	166	198	268
.40	70	77	86	97	116	151
.50	46	50	56	63	75	101
.60	33	36	40	45	53	71
.70	25	27	30	34	40	53
.75	22	24	27	30	35	46
.80	20	22	24	27	31	41
.90	17	18	20	22	25	34
1.00	15	15	17	18	21	28
1.25	12	12	13	14	15	19
1.50	11	11	12	12	13	16

with $\alpha = .05$ and power = .80. Referring to Table 4, the required sample size is 34.

How do the sample sizes determined by considering the Type II error compare with those in the table developed by Krejcie and Morgan (1970)? Before such a comparison can be made, it is necessary to adjust the sample sizes here using the finite population correction (fpc) which was incorporated into the formula used by Krejcie and Morgan (1970). The fpc, which adjust the sample size when there is less than an infinite population, is made as follows (Cochran, 1963, pp. 23-24):

$$n_f = \frac{n_i}{1 + (n_i/N)}$$

where:

n_f = the required sample size for a finite population

n_i = the required sample size for an infinite population

N = the population size

In many instances, the fpc will not be needed in determining the sample size. As Cochran (1963) observed, "the fpc can be ignored whenever the sampling fraction does not exceed 5%" (p. 24). Such a correction may be needed in using Tables 1-4.

Table 5 was developed for the purpose of comparing the Krejcie and Morgan (1970) sample sizes with those in this paper. According to Krejcie and Morgan (1970, p. 608), the sample size for N = 1,000,000 (with $\alpha = .05$, $d = .05$ and using a two-tailed test) is 384. The corresponding sample size from Table 5 is 785. Why is there such a large difference in the sample sizes? The answer is that power = .80 /the level suggested by Cohen (1965) and McNemar (1960) for sample size calculations/ was used in Table 5 while in the Krejcie and Morgan (1970) table power is .50 or less. Given that agricultural education researchers can select the significance level and power to use, one of the most important questions remains. What effect size should be used? In both cases above (Table 5 and the Krejcie and Morgan table), $d = .05$ was used. According to Table 5, with N = 1,000,000, $d = .10$ and using a two-tailed test, the sample size is 197 (about one-fourth as large as that required for $d = .05$). This example is not intended to show that .10 should be used rather than .05. Instead, it merely illustrates the crucial nature of the effect size question.

Table 5 provides sample sizes for various populations for both one- and two-tailed tests. The sample sizes for $d = .05$ with a two-tailed test may be compared with those in the Krejcie and Morgan (1970) table. The sample sizes for one-tailed tests are smaller than those for two-tailed tests. Comparisons of sample sizes in Tables 1-4 show that, for a given sample size, a one-tailed test is more powerful than a two-tailed test.

Table 5

Sample Sizes for Proportions With Two Effect Sizes, $\alpha = .05$, and Power = .80

	Sample size			
	d = .05		d = .10	
N	One-tailed test	Two-tailed test	One-tailed test	Two-tailed test
100	87	89	61	67
500	277	306	119	142
1,000	383	440	135	165
5,000	551	679	151	190
10,000	583	728	153	194
50,000	612	773	155	197
1,000,000	619	785	155	197

OTHER CONSIDERATIONS IN DETERMINING THE SAMPLE SIZE

Up to this point, the technical aspects of providing estimates of sample sizes for the one-sample case have been discussed. However, there are many other concerns that should be considered. In the following paragraphs several of the more frequently encountered ones will be discussed. While definitive answers to the problems inherent in these concerns will not necessarily be provided, hopefully sufficient insight will be provided to assist researchers in addressing the concerns.

First of all, the assumption made in all of the articles cited in this paper as well as those cited in the previous article by Hinkle and Oliver (in press) is that samples of size *n* are to be drawn randomly. No mention is made of sampling methods other than simple random sampling. If other sampling methods are to be employed, adjustments must be made to the variance estimates (and thus the effect sizes) before using the enclosed tables as well as those in the previous article. Procedures for adjusting the variance estimates are considered in Cochran (1963), Kish (1965), and Sudman (1976).

A second concern is the rate of response and how it relates to the necessary sample size. Actually, there are two issues. First, the sample size tables assume a 100% response rate, i.e., the value for the sample size from the table *is* the sample size required. Since it is the exception rather than the rule to have a 100% response rate, over sampling must be considered in order to meet the sample size requirements for the study. Second, the question is frequently raised relative to what is an acceptable response rate. As Kerlinger (1973) points out, "Returns of 40 to 50% are common. Higher percentages are rare. At best, the researcher must content himself with returns as low as 50 to 60%" (p. 414). In spite of statements such as this, the only appropriate response rate is 100% unless the researcher can be assured that there is no bias operating in the sample (i.e., there is no systematic reason why some people responded while others did not). Therefore, it is important to over sample as well as to conduct a follow-up of nonrespondents in order to assure an adequate sample which is free from response bias.

The enclosed tables assume that the measurement scale of the response measure is either dichotomous or interval/ratio. However, many survey instruments are items which require other response modes such as Likert scales, semantic differentials, etc. The inadequacy of the Krejcie and Morgan table regarding the limitation to dichotomous measures has been discussed previously. A similar limitation is imposed in the tables included here and in the previous article; only dichotomous and interval/ratio variables can be considered. In order to use these tables for ordinal variables, such as Likert scales, it is necessary to either dichotomize the response mode for the variables or treat them as interval variables. The former is *not* recommended but there is good justification for the latter. This justification involves requiring the researcher to determine the effect size given the variance estimate. Elliott (1980) recommended an interesting procedure for estimating the variance for a Likert scale measure in determining a sample size estimate. He suggested using $(\text{Range}/2)^2$ as the estimated variance (the range is one less than the number of scale points). However his procedure for estimating the sample size did not consider either the effect size or the Type II error. If the researcher can use this estimated variance in determining an appropriate effect size and standardize it into standard deviation units, the sample size tables for interval scale measures can be used for Likert scale data. For example, a 5-point Likert scale has a range of 4, the estimated variance is 4, and the standard deviation is 2. If a difference of 1 scale point is felt to be of major importance, the effect size woule be set at $.50\sigma$.

Another concern regards multiple items on a survey instrument and selecting the one to be used for estimating the required sample size. Krejcie and Morgan (1970) assumed $p = q = .50$ in order to maximize the variance estimate and thus the sample size. They and other authors assumed that the variance estimates and the corresponding effect sizes to be constant for all items. This is of course an inappropriate assumption. Cochran (1963) suggests that since "more than one item or characteristic is usually measured in a sample survey, . . . a series of conflicting values of n, one for each item, /would be calculated, and/. . . some method must be found for reconciling these values" (p. 73). While following this suggestion may appear to be an elaborate process, it must be emphasized that consideration should be given to the problem of multiple items on the survey. Multiple estimates of the effect size and, thus, multiple estimates of the sample size are required. It should be obvious that if such a process is followed the largest estimated sample size should be used.

Finally, it must be noted that the emphasis in this paper has been on the one-sample case, i.e., the general case for survey research. The tables included assume that their use will be for determining the sample size needed for estimating parameters within a certain degree of accuracy (i.e., the effect size). On the other hand, experience has shown that when such a survey is conducted, the researcher not only uses the data to estimate these parameters but also compares the responses between two or more subclassifications of respondents. For example, differences between male and female respondents are investigated as well as differences between white and nonwhite respondents, rural, suburban and urban respondents, etc. If the researcher plans to use the results of the survey to make such comparisons, the enclosed tables are *not* appropriate for determining the sample sizes necessary for effect sizes for differences between these subclassifications of respondents. The tables provided in Hinkle and Oliver (in press) must be used.

THE LAST WORDS!

This paper was designed to provide assistance in answering the sample size question--not to provide *the* answer. Hopefully attention has been drawn to the complexity of what appears to be a simple question. It is the contention of the authors that the sample size question is unanswerable without first answering the effect size question.

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PATH ANALYSIS: COMBINING THEORY AND STATISTICAL TECHNIQUE IN THE ANALYSIS OF EDUCATIONAL RESEARCH DATA

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Path Analysis: Combining Theory and Statistical Technique in the Analysis of Educational Research Data

Path Analysis was first recognized as a statistical technique over 50 years ago. This technique was originally based on a theoretical concept involving agricultural economics and animal genetics.

Limited advances have been made in applying this technique to educational research endeavors. The path analysis statistical technique provides the researcher a new perspective in analyzing a set of variables not possible utilizing traditional statistical techniques. The researcher sets up a theoretical model based on the variables he/she wishes to investigate. The path analysis is then used to test the relationships among the variables in the model. According to Goldberger (1972), these models provide an equation which "represents a causal link, rather than a mere empirical association."

This technique has been referred to as "path analysis" because it traces the direct influence of each separate path in a systematic approach. It provides a method for decomposing and interpreting the linear relationship(s) along each separate path included in the model; and then calculates the degree to which each variable contributes to the model. The technique requires that the researcher possess a knowledge of the possible logical and potential statistical correlations among the variables to be included in the model.

The original concept of path analysis was developed in econometrics to calculate prices and production potential for corn and hogs. However, Wright's (1921) writings tended to be heavily mathematical in nature, emphasizing the complexity of calculating "path coefficients."

This may have contributed to the failure of other researchers in genetics and related fields to incorporate his ideas into research studies.

Path analysis lay rather dormant in other subject matter fields until Blalock (1964) and Duncan (1966) applied this theoretical concept to research conducted in the field of sociology. This technique has also been utilized to reinterpret studies previously analyzed by traditional statistical procedures (Duncan, Haller, and Porters, 1968). Werts and Linn (1970) later applied the theory and mathematical design developed by Sewell and expounded by Blalock and Duncan to help solve traditional psychological problems.

Although educational research enjoys close kindred with sociology and psychology, few research articles are available in the literature related to the application of path analysis to educational research. In 1971 Feldman used path analysis to classify and describe colleges and universities and in 1980 Wolfe outlined some strategies for utilizing path analysis in educational research. The technique of path analysis has therefore progressed through the fields of animal biology, economics, sociology, psychology, and gradually into education.

Theoretical Framework

As previously discussed, path analysis is useful in testing theory, rather than generating it. Decisions must be made concerning the relationship and underlying theoretical framework among a set of variables in order for the researchers to use this method.

A qualitative diagram is constructed in which every variable, measured or hypothetical, is included. Then the bivariate relationships are indicated by arrows, curved lines or absence of any symbol. These bivariate relationships are determined by the researcher, based on the theoretical framework for which the diagram is constructed. Completion of the diagram requires the introduction of a symbol to account for variables not explained in the model. These unexplained variables are usually referred to as extraneous variables. These extraneous variables are usually exogenous or endogenous variables.

Exogenous variables are those considered to be influenced by other variables outside of the system. Land (1969) points out, "the exogenous variables in a particular set may be correlated among themselves; however, the explanation of their intercorrelation is not a problem for the system under consideration" (p. 6). Endogenous variables are completely determined by variables included in the model as well as by residual variables. Residual variables, having a mean value of zero, are introduced into a model where the variation of an endogenous variable is not completely determined by other variables. This allows calculation to account for the variance of the endogenous variables not explained by measured variables (Land, 1969).

Recent studies by Anderson and Evans (1974) and Feldman (1971) have used path analysis to re-examine data from research studies in education. Jencks (1972) used path analysis in his re-interpretation of the data from the Coleman Report; Borich and Drezek (1974) used path analysis for evaluating instructional programs.

The theoretical framework on which this paper is based, deals with the analysis of the student teaching experience. Sarason, Davidson, and Blatt (1962, p. 116) stated that "what are desperately needed are studies which have as their aim a detailed description of what goes on between the neophyte and supervisor..." The challenges facing those who work with student teachers are greater than ever before. The quality of any teaching program depends largely upon the efforts, the attitudes, and the ability of the student teacher, the cooperating teacher, and the university supervisor working jointly.

According to Heim (1979) the morale of teachers is a growing concern at all levels of the educational process. Many factors tend to influence the morale of teachers during their professional career. The process involved in the development of positive or negative morale in the teaching career of a professional educator has not been determined. However, based upon the findings of MacDonald (1961), Sharp (1964), Symonds (1954), Walbert (1966), and Yee (1968) there is a need to look at various personality factors and situations that contribute to the morale of student teachers and cooperating teachers. Since the research emphasized the paramount influence that the cooperating teacher exerts on the student teacher, this relationship also needs further investigation (Festinger, 1957). According to Heim (1979), Mahan and Lacefield (1979), and Yee (1968) many elementary, secondary schools and institutions of higher education around the nation have indicated morale of their faculty to be an area of concern.

According to Gettone (1980) current research is needed to analyze the student teaching experience and its influence on student teachers as they are developing their role expectations of a teacher. This problem is more critical when the cooperating teacher is not sure of the role of the student teacher during the student teaching experience. Simms (1975) found that 40 percent of the cooperating teachers surveyed had no training in the supervision of student teachers. The impact of the student teaching experience on future performance as a teacher has not been fully determined.

Briers and Byler (1979), Cheek, McGee, and Cole (1980), and Sunal and Heidelbach (1977) assessed the morale of student teachers using the Purdue Student Teacher Opinionare (PSTO) as a pretest and posttest measure. Byler and Byler (1981) also used the PSTO to assess morale of student teachers before and after the student teaching experience. The Purdue Teacher Opinionare (PTO) was administered to the student teachers' cooperating teacher. One year later the PTO was administered to those former student teachers who are now employed as teachers.

Since these four scores met the basic assumptions of path analysis outlined by Kerlinger and Pedhazur (1973), they were used to develop a path diagram. The types of bivariate relationships within the model were determined based on the literature and the theoretical model developed for this study.

Significance of the Problem

Statisticians in education appear to have somewhat ignored the use of path analysis as a statistical procedure. Other than a few expositions in response to Wright's writings, limited information is found in the literature on the application of path analysis to research in education. Many of the examples in the literature tend to emphasize mathematical calculations instead of application.

This paper will attempt to develop and apply the techniques of path analysis and its theoretical concept to longitudinal research in education. Ideally, in educational research, an attempt is made to design a study in which the direct influence of one variable on another is determined, with all other possible causes of variation eliminated. However, the causes of extraneous variance are often beyond the research's control. According to Anderson and Evans (1974), this "causal modeling procedure developed in economics and biology provides social scientists with powerful methodological tools that permit them to bridge the gap between theory and research." Consequently, path analysis can serve as a useful tool for designing and interpreting longitudinal educational studies. It is on this premise that the following path diagrams and calculations have been developed.

Statement of the Problem

The purpose of this study was to determine the relationship(s) among: student teachers' morale and attitudes before the student teaching experience; their morale and attitudes after the student teaching experience; their morale and attitudes as first year teachers; and the influence their cooperating teachers' attitudes and morale had on these students, who student taught during the Fall of 1980 at Mississippi State University.

Research Questions

Utilizing the technique of path analysis, the following research questions were investigated:

1. Would there be a significant correlation between student teachers' pretest and posttest scores on the Purdue Student Teacher Opinionare (PSTO)?
2. Would there be a significant correlation between student teachers' posttest scores on the PSTO and their cooperating teachers' scores on the Purdue Teacher Opinionaire (PTO)?

3. Would there be a significant correlation between student teachers' socres on the PTO as first year teachers and their cooperating teachers' scores on the PTO?
4. Would there be a significant correlation between student teachers' pretest scores on the PSTO and their cooperating teachers' scores on the PTO?
5. Would there be a significant correlation between student teachers' posttest scores on the PSTO and their PTO scores as first year teachers?

Population

The population consisted of 155 student teachers in the College of Education who student taught during the Fall of 1980, and their cooperating teachers.

Sample and Instrumentation

The sample for this study consisted of the student teachers in the College of Education who student taught in the Fall of 1980 and had met the following criteria: completed pretest and posttest measures on the PSTO; completed and returned the PTO during their first year of teaching; and their cooperating teacher had completed the PTO during the Fall of 1980. The sample consisted of 40 student teachers who met the above criteria.

Although the sample size used in this study does not meet the criteria of adequate sample size, emphasis has been placed on the procedure. The sample is merely used in order to give a concrete example of how path analysis can be used in educational research.

Utilizing Path Analysis to Interpret Research Data

Path Analysis is a method of interpreting and decomposing linear relationships among a set of variables based on the assumptions that a weak causal order among the variables to be analyzed is known, and that there is causal closure for the relationships among these variables. Therefore, path analysis becomes primarily a technique of logically working out the consequences of these two assumptions.

The following "operational" definition is proposed for causal order and causal closure, ignoring for the moment sampling and measurement errors. Causal order is defined as the extent to which variable X_1 affects X_2, but X_2 cannot affect X_1 ($X_1 \geq X_2$). Causal closure is defined as the extent to which all variables that might contribute to any variance in the path model are included.

In order to define these two terms we must also consider causal effect: X_1 is the cause of X_2, if and only if X_2 can be changed by "manipulating" X_1 and X_1 alone. Consequently, possible "manipulation" is implied in the model, as well as some prediction from this manipulation. However, manipulation of X_1 alone does not imply that all other causes of X_2 are controlled or held constant.

The manipulation of X_1 alone may also bring about changes in many other variables affected by X_1; these changes may, in turn, affect X_2. However, the researcher should not attempt to control or hold constant the changes in other variables as the effect of X_1 on X_2 is examined.

According to Blalock (1964) a causal system is linear, additive, and unidirectional. The relationship between the manipulated changes in X_1 and X_2 in the "ideal" experiment is therefore a linear function, such that $X_2 = C_{01}X_1$, where C_{01} is a constant standing for the magnitude of change in X_2 for a standard deviation unit of change in X_1. This constant is referred to by Blalock as an "effect coefficient."

For the purpose of explaining how a path diagram is developed and calculated, we shall examine a concrete example. In 1980 the authors began a study of student teachers in the College of Education at Mississippi State University. The original sample consisted of 155 student teachers who agreed to participate in the study. Each student teacher responded to items on the Purdue Student Teacher Opinionaire (PSTO) as a pretest measure before leaving campus for the student teaching experience. The PSTO was also administered at the completion of the student teaching experience in November, 1980, as a posttest. At the same time, their cooperating teachers responded to the Purdue Teacher Opinionaire (PTO). Finally, after graduation a follow-up study was conducted to solicit PTO responses from the student teachers who entered the teaching field.

In order to develop the complete path diagram it was necessary to use data from only the students who completed their student teaching during the Fall of 1980, and for whom the following data were available:

1. Responses on the PSTO before the student teaching experience (pretest).
2. Responses on the PSTO after the student teaching experience (posttest).
3. Their cooperating teachers' responses to the PTO during November of 1980.
4. Responses to the PTO during the spring, 1982, by those student teachers who had entered teaching.

As in many longitudinal studies, the sample tended to decrease with time because of difficulty with follow-up procedures. As a result, the sample for this analysis consisted of 40 student teachers. Hence, the authors would like to emphasize the procedure rather than the sample size or possible sampling error in the study (Kerlinger and Pedhazur, 1975). This sample is used in order to give a concrete example of how path analysis can be utilized in longitudinal studies for educational research.

Let us now consider an example of how the effect coefficient functions based on our data. The student teacher group was administered the PSTO as a pretest (X_1) and posttest (X_2). The path analysis revealed an effect coefficient of .33 for the relationship between X_1 and X_2. Therefore ideally, for one unit of change in X_1 there would be a .33 unit of change in X_2, or $X_2 = (.33)(X_1)$. If the two assumptions of weak causal order and causal closure are met, the researcher can interpret the regression coefficient as the effect coefficient.

Causal Order

To further define the effect coefficient, we need to consider the first assumption of path analysis which is "weak causal ordering." This occurs when X_1 and X_2 comprise a weak causal order ($X_1 \geqq X_2$).* It is assumed that X_1 may or may not affect X_2, but X_2 cannot affect X_1. Remember, however, that this technique does not require X_1 to cause X_2.

Some causal ordering is fairly clear, for example, a pretest score would come before a posttest score. Therefore, the researcher must determine the logical sequential development of the variables included in the path diagram. Let's consider another example using our group of student teachers. Each student teacher was given the PSTO (X) before the student teaching experience and again at the completion of the student teaching experience (Y). Also, at the completion of the student teaching experience, their cooperating teachers were administered the PTO (Z). Therefore, the following path diagram could be developed:

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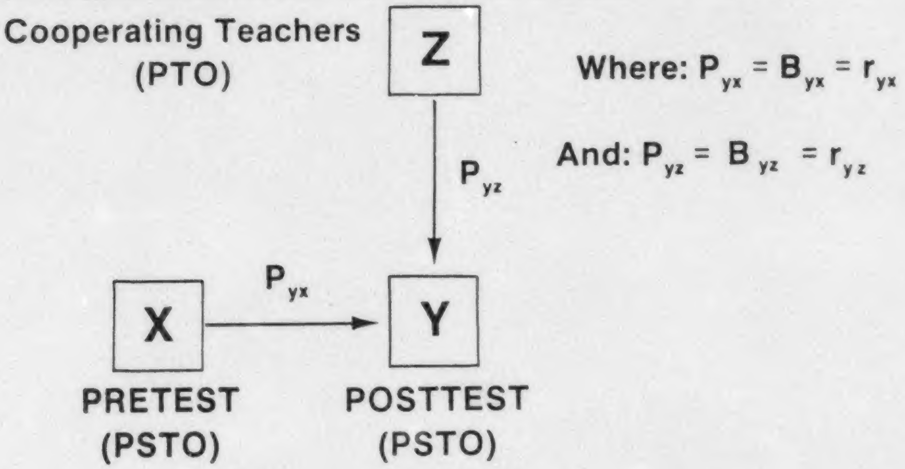
*The symbol $\geqq$ is used to indicate a weak causal order and should not be taken to mean "equal to or greater than," (Nie, N. H., etc., 1975).



Where: $P_{yx} = B_{yx} = r_{yx}$

And: $P_{yz} = B_{yz} = r_{yz}$

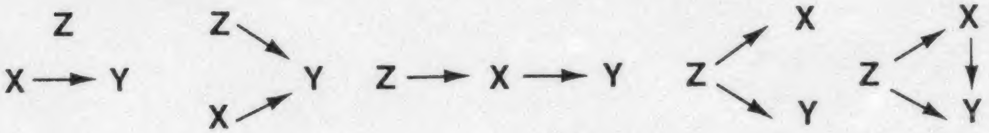
FIGURE 1

In this path diagram, X (pretest) is depicted as a possible influence on the student teachers' scores on the posttest, but not vice versa; this is indicated by the straight directional arrow drawn from X to Y. Also, it would be logical to assume that the student teachers' posttest scores (Y) could possibly be influenced by the cooperating teachers' PTO scores (Z). The relationship between Z and Y is also illustrated by a single-headed directional arrow, which indicates that Z may have an influence on Y, but Y probably does not have an influence on

Z. The researcher would assume no correlation between the student teachers' pretest scores (X) and the cooperating teachers' scores (Z), as indicated by either a curved line or the absence of a straight line. Finally, since X (pretest) was given before Z (PTO) and Y (posttest), consequently the S_{yz} (effect coefficient) could be calculated by considering the residual effects of the pretest scores (X) on the posttest scores (Y), but this is not indicated in this simplified model.

Causal Closure

The second general assumption required for path analysis is causal closure. In a bivariate covariation, say between X and Y, with a known weak causal ordering, say $X \geq Y$, the observed covariation between X and Y may be: (1) due to mutual dependence on an outside variable(s), (2) due completely to the causal dependence of Y on X, or (3) a combination of (1) and (2). Some examples of these causal structures with possible covariation are:



(a) (b) (c) (d) (e)

FIGURE 2

According to Nie, Hull, Jenkins and Steinbrenner (1975), Z is not causally connected to Y or X in example (a); however, X is a cause of Y, but Y is not a cause of X. And, in (b), X is a cause of Y but not of Z. Z is also a cause of Y but not of X. In (c), Z is a cause of X and Y, and the effect of Z on Y is completely contained in X. These three models indicate that they are causally closed to outside influence with respect to the covariation.

In (d) and (e), the covariation is not closed to outside influence. In (d), outside causes influence the covariation between Y and X. Whereas in (e), the causal dependence of X on Z influences the covariation between X and Z, because Y and X share a common cause. Let's look at our relationships in Figure 1 again, in which X = student teachers' pretest scores on the PSTO, Y = student teachers' posttest scores on the PSTO, and Z = their cooperating teachers' scores on the PTO. After statistical analysis of the data, the standard regression coefficient is used to indicate the effect coefficient in the bivariate relationship for P_{yx}, and P_{yz}.

However, in Figure 1 the assumption of closure is not explicitly indicated in this three variable model. Also, the absence of E_{ij}, which represents all the residual causes of each of the variables, is excluded from this model.

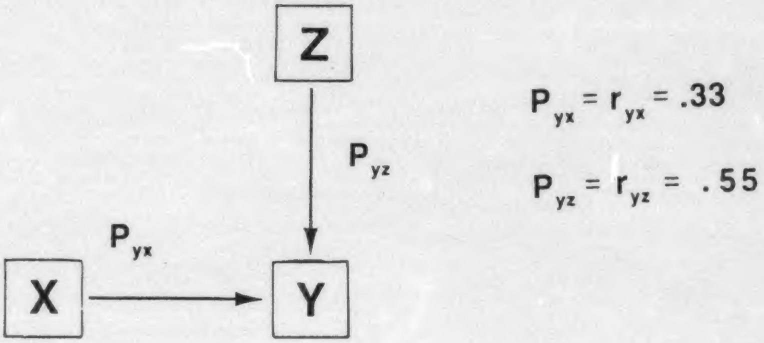
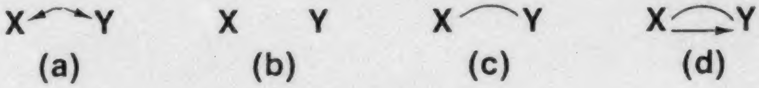


FIGURE 3

Therefore, the effect coefficient for the relationship between X and Y is $P_{yx} = r_{yx} = .33$ and the effect coefficient for the relationship between Z and Y is $P_{yz} = r_{yz} = .55$. However, the latent or extraneous variables which might influence X or Z are not included in the model. Therefore, the effect coefficient for the relationships between Z and Y and X and Y must be calculated as merely restatements of the regression coefficients for each of these bivariate relationships.

Additional Types of Bivariate Relationships

Now that we have defined causal closure and causal order, and have utilized effect coefficients to calculate path coefficients, we need to define additional types of bivariate relationships. It is a method by which a set of causal assumptions are imposed by the researcher in order to trace out the implications for a set of variables. Therefore, ambiguous assumptions incorporated into the model lead to ambiguities in interpreting the results. Realizing these limitations we need to consider several other methods for representing bivariate relationships:



(a) (b) (c) (d)

FIGURE 4

In (a), the double-arrowed curve represents an unanalyzed correlation or the linkage between X and Y is left ambiguous; the link may be causal or spurious. The direction of causation may be from X to Y or Y to X. This indicates that the relationship between Y and Z may be causal or spurious; either is unknown to the researcher according to Nie, et al. (1975).

The absence of an arrow in (b) indicates that no covariation exists between Y and Z. The simple curve in (c) represents a completely spurious or noncausal covariation between Y and Z, and finally the directional arrow and curve in (d) represents a bivariate relationship that is partly causal and partly spurious.

Causal Models

By applying a general path analysis model to a bivariate relationship, little information is usually generated from the data in addition to that already applied by the model. However, this situation changes as more variables are added to the model. For example, consider three variables where X_1 = student teachers' PTO scores as first year teachers, X_2 = student teachers' PSTO posttest scores, and X_3 = student teachers' PSTO pretest scores. The model will assume a weak causal order, such that $X_3 \geqq X_2 \geqq X_1$ (or that the PSTO pretest scores influence the PSTO posttest scores and the posttest scores then influence the first year PTO scores), and causal closure. For causal order we do not have to know, but make the assumption that one variable affects the other, and that one variable is likely to be affected by another variable. However, the justification of causal closure is more difficult. Keep in mind that causal closure assumes covariation due to dependence of two variables on each other, mutual dependence on outside variable(s) or both.

This path diagram will not only include the latent or extraneous variable(s) (E_{ij}) which are not explained. If we did not want to include the influence of extraneous variable(s), the (E_{ij}) would be omitted from the model. Figure 5 illustrates this general model.

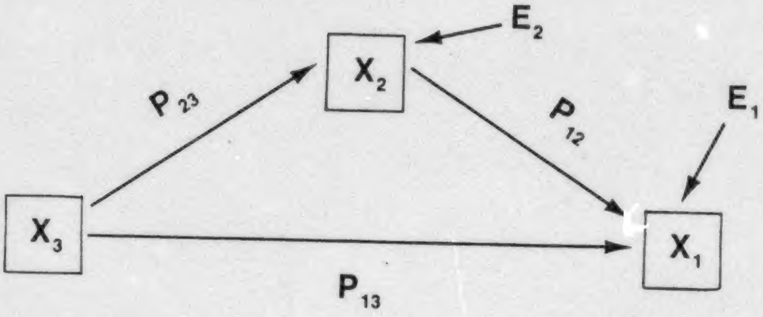


FIGURE 5

In this general model, any one of the paths can be zero; or, equivalently, or any one of the S_{ij} can be null. This model could also be expressed as a system of linear equations.

According to this model S_{23}, the effect or path coefficient may be estimated from the regression of X_2 on X_3, in other words the regression of the PSTO posttest scores (dependent variable) on the PSTO pretest scores (independent variable). And, S_{13} and S_{12} may be estimated from the regression of X_1 on X_2 and X_3, or the first year teachers' PTO scores on the PSTO posttest scores, and PSTO pretest scores.

In general, given n variables in which a weak order has been identified X_n . . . X_2 X_1, the path coefficients can be estimated by utilizing (n - 1) regression solutions. Each regression solution (n - 1) will require lower-order variables as dependent variables in succession and all of its higher-order variables as predictors. In this example, the highest order variable was the first year teacher scores on the PTO, next the PSTO posttest, and last the PSTO pretest, in order of reverse sequential development. It would not be logical to assume that the pretest scores were obtained after the posttest scores or the first year teachers' scores. It would also not be logical to assume that the posttest scores were obtained after the first year teacher scores.

Now, we can first calculate the ordinary regression coefficients or standard betas, since it is customary to use the beta values because of interpretation, and because of Wright's original formulation. We can also calculate the path coefficients from extraneous variables (i.e., all residual causes) associated with X_2 by the formula $\sqrt{1 - r^2}$, where the multiple R is that part of the regression equation in which X_3 is the dependent variable and all causally prior variables are used as predictors.

Completion solution of the path analysis previously introduced would therefore be:

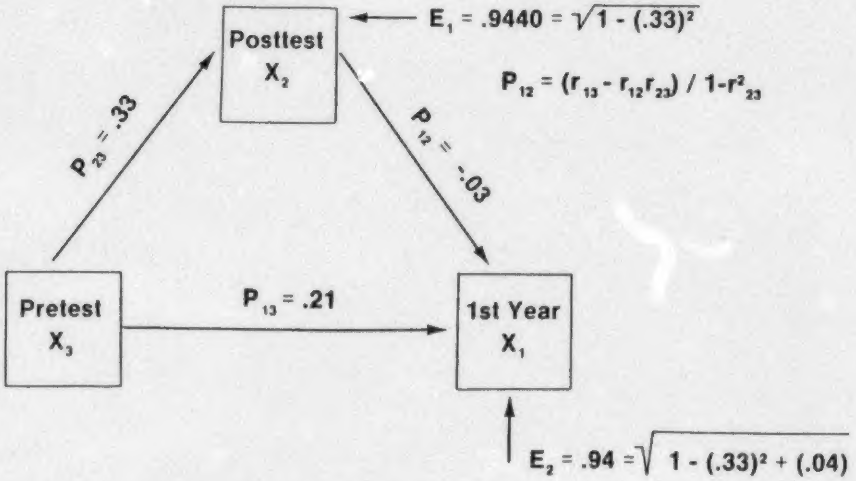

Posttest
X_2
$E_1 = .9440 = \sqrt{1 - (.33)^2}$
$P_{12} = (r_{13} - r_{12}r_{23}) / 1 - r^2_{23}$
$P_{23} = .33$
$P_{12} = -.03$
Pretest
X_3
$P_{13} = .21$
1st Year
X_1
$E_2 = .94 = \sqrt{1 - (.33)^2 + (.04)}$

FIGURE 6

Interpretation of Path Analysis

Using Figure 6 we will discuss how to interpret the results of path analysis. There are now eight different causal structures in this model, because there are three variables with extraneous causes instead of the originally defined bivariate relationships. Therefore, the three-variable model is no longer a restatement of the original two assumptions of causal order and causal closure.

To assess the completeness of each relevant subsystem it is necessary to examine the path coefficients from the extraneous variables. After the examination of extraneous influences on the PSTO posttest scores and first year teacher PTO scores, analysis revealed that 94 percent of the variation in PTO scores for first year teachers remains unexplained by the causal relations included in this model. (Note: This is of interest since further analysis using a Pearson Product Moment Correlation statistical procedure revealed a significant correlation between PSTO pretest and PSTO posttest scores; and, the correlation between PSTO pretest scores and the PTO scores for first year teachers. Both relationships were significant at the .01 level.)

Next, we can identify the effects of PSTO pretest scores on PSTO posttest scores, then calculate the effects of the posttest student teacher scores on first year teachers' PTO scores. And finally, calculate the effect of student teachers' PSTO pretest scores on their PTO scores as first year teachers. As previously discussed, the effect coefficient C_{ij} measures the accompanying changes in X_1, given a unit change in X_{ij} while controlling for "extraneous" causes. Using this model the effect coefficients can be calculated as follows:

$$C_{23} = r_{23} = .33$$

$$C_{13} = (r_{23})(r_{13}) + r_{12} = (.33)(.01) + .21 = .21$$

$$C_{12} = (r_{12} - r_{13}r_{23})/1 - r^2_{23} = .04 - (.21)(.33)/1 - (.33)^2 = -.03$$

Using C_{12} as the effect coefficient for the relationship between PSTO pretest scores and first year teachers' PTO scores, we can calculate the effect of change in X_1 with a change in X_3. If we change the PSTO pretest scores (X_3) by one standard deviation unit, the accompanying change in the first year PTO scores is .21. This occurs because changes in PSTO pretest scores will also bring about changes in PSTO posttest scores. However, since the change in PSTO posttest scores is .01 standard unit the results tend to have little effect on the influence of PSTO pretest scores on first year PTO scores.

It is also possible to break down the total covariation between pairs of variables, represented by simple r, into direct causal and indirect causal effects. This allows the researcher to determine total causal and noncausal bivariate covariation.

As previously states, it is necessary to calculate effect coefficients C_{ij}, representing total causal effect of higher-order variables on those lower-order variables, to make a complete causal interpretation.

Table 1 reveals an example of the partial decomposition of bivariate covariation, represented by simple r, for the data presented thus far.

In order to decompose or break down the bivariate relationship, the effect coefficient C_{ij} is subtracted from the original covariation r_{ij}. The table indicates that the relationship between the pretest and posttest on the PSTO is no more than a restatement of the original assumptions and the covariation between the two is considered causal or genuine. Also, all covariation between the pretest of the PSTO and first year teachers' scores on the PTO is considered causal. However, the bivariate relationship between the posttest scores on the PSTO and

Table 1. Decomposition of Bivariate Covariation Among the PSTO Pretest Scores, PSTO Posttest Scores and First Year Teacher PTO Scores

Bivariate relation of concern	(Posttest, Pretest) X_2, X_3	(1st Yr., Pretest) X_1, X_3	(1st Yr., Posttest) X_1, X_2
(A) Original Covariation = r_{ij}	.33	.21	.04
(B) c1: causal-direct	.33	.21	.01
c2: causal-indirect	0	0	0
total causal =			
$(c_1) + (c_2) = C_{ij}$	.33	.31	.01
(C) Noncausal =			
$(A) - (B) = r_{ij} - C_{ij}$	0	0	.03

first year teachers' scores on the PTO indicates that .03, or three-fourths of the original association (.03) is spurious and only .01 is causal. Therefore, path analysis enables us to determine how much of the causal relationship between the pretest scores on the PSTO and the first year teachers' scores on the PTO is "interpreted" by the intervening variable of PTO posttest scores.

As the researcher adds more variables to the model, it is possible to partially test closure, and as more variables are added to the model, decomposition strictly on the basis of assumptions diminishes.

Four Variable Student Teacher-Teacher Model

The final model we would like to outline is based on data previously discussed; however, a fourth variable is added to the model. The four variables in this model are: X_1 = first year teachers' scores on the PTO, X_2 = cooperating teachers' scores on the PTO, X_3 = student teachers' posttest scores on the PSTO, and X_4 = student teachers' scores on the PSTO pretest.

In this model we are willing to suppose that five weak causal orders could exist with several possible structures. The five possible weak causal orders are:

1. The PSTO pretest scores are likely to influence the PSTO posttest scores, which in turn influence the first year PTO scores, $X_4 \geqq X_3 \geqq X_1$.
2. The cooperative teachers' PTO scores are likely to affect the student teachers' PSTO posttest scores, $X_2 \geqq X_3$.
3. The student teachers' PSTO posttest scores are likely to affect the cooperating teachers' PTO scores, $X_3 \geqq X_2$.
4. The first year teachers' scores on the PTO are likely to be affected by their PSTO pretest scores, $X_4 \geqq X_1$.
5. The first year teachers' scores on the PTO are likely to be affected by their cooperating teachers' scores on the PTO, $X_2 \geqq X_1$.

In this four variable model we will make the assumption that the cooperating teachers' scores on the PTO are not likely to be influenced by the student teachers' pretest scores. Also, in this model we will consider the influence of latent variables. The four variable general model is presented in Figure 7.

The path coefficients for this model are estimated using the following formulas:

1. P_{34} = Simple correlation coefficient between X_4 and X_3
2. P_{24} = Simple correlation coefficient between X_2 and X_4
3. $P_{23} = r_{23} - P_{34}(P_{24})$ = coefficient of residual covariation

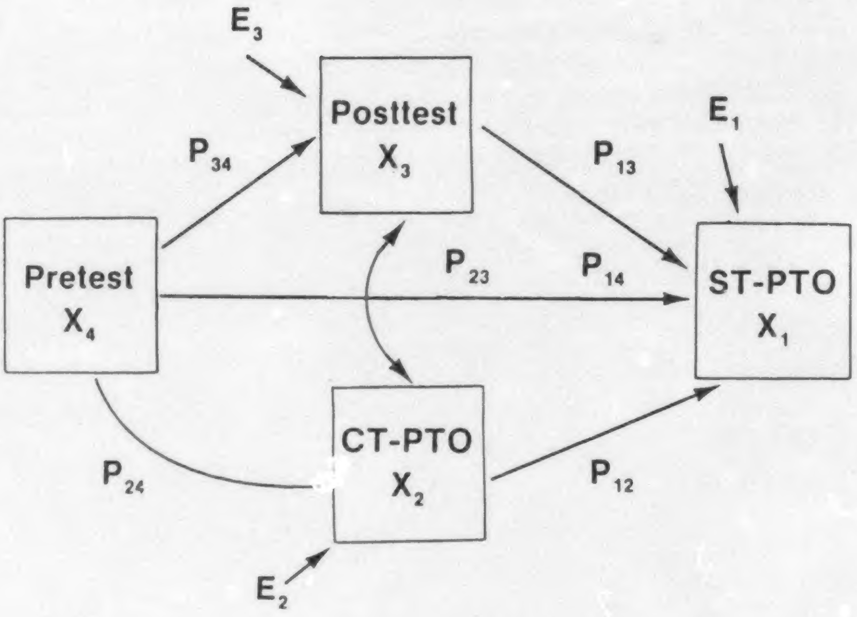

E_3
Posttest
X_3
E_1
P_{34}
P_{13}
Pretest
X_4
P_{23}
P_{14}
ST-PTO
X_1
CT-PTO
X_2
P_{24}
P_{12}
E_2

FIGURE 7

4. P_{13}, P_{12} and P_{14} by the regression of X_1 on X_2, X_3, and X_4 (regression of higher-order variable on lower-order variable, one at a time)

5. $P_{13} = (r_{12} - r_{13}r_{34})/1 - r^2_{34}$ = coefficient of residual covariation, with the correction factor applied.

6. $E_1 = 1 - P^2_{1.234}$
$E_2 = 1 - P^2_{3.4}$
$E_3 = 1 - P^2_{2.4}$

Although the coefficients for the paths coming from E_3 and E_2 are of no particular interest, they are included in this model for clarification and discussion.

The complete solution of the sample path analysis presented in Figure 7 and the resultant path diagram is presented in Figure 8:

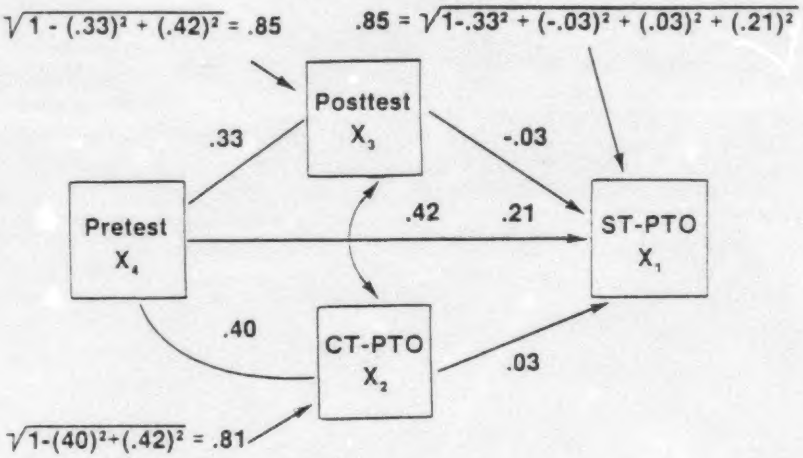

$\sqrt{1 - (.33)^2 + (.42)^2} = .85$
$.85 = \sqrt{1 - .33^2 + (-.03)^2 + (.03)^2 + (.21)^2}$
Posttest
X_3
.33
-.03
Pretest
X_4
.42
.21
ST-PTO
X_1
.40
CT-PTO
X_2
.03
$\sqrt{1 - (40)^2 + (.42)^2} = .81$

FIGURE 8

The actual coefficients from our data were: $P_{34} = .33$ (significant at the .05 level of probability) and $P_{24} = .40$ (significant at the .01 level of probability). The simple correlation between the student teachers' posttest scores (X_3) and the cooperating teachers' PTO scores (X_2) was .55 (r_{23}) (significant at the .01 level); however, it was necessary to calculate the effect coefficients in order to determine the residual covariation [$S_{23} = r_{23} - S_{34}(S_{24})$] between X_2 and X_3. After the calculations $P_{23} = .42$ instead of .55.

P_{13}, P_{12}, and P_{14} were calculated by the regression of X_1 and X_2, X_3 and X_4. The results yielded simple correlation coefficients for $P_{13} = .04$, $P_{12} = .03$, and $P_{14} = .21$. However, since S_{34} was assumed to have attributed some variance to the relationship between X_1 and X_3, the coefficient of residual covariation for P_{13} was calculated utilizing the formula $P_{13} = (r_{12} - r_{13}r_{34})/1 - r^2_{34}$, thus yielding a coefficient for $P_{13} = -.03$ instead of .04. This formulation meets the established rules of estimating recursive causal models by multiple regression estimation procedures, thus providing a correcting procedure.

A simplified interpretation of Figure 8 would be that there is a correlation between the student teachers' pretest scores on the PSTO and their scores on the PTO at the end of their first year of teaching for the student teachers included in this study ($r_{14} = .21$). But this relationship is partially "interpreted" by the student teachers' posttest scores on the PSTO (to the extent of $P_{34} = .33$ and $P_{13} = -.03$ instead of .04) because of the influence of the PSTO pretest scores. There is also not a direct path between the student teachers' posttest scores on the PSTO and their cooperating teachers' PTO scores ($r_{23} = .55$ and $P_{23} = .42$) because of the residual influences of the PSTO pretest scores.

Although the path diagram does not indicate a logical relationship between the student teachers' pretest scores on the PSTO and the cooperating teachers' PTO scores, it was necessary to calculate this correlation in order to analyze the indirect effect of all variables, so that correct estimations could be made (Thiel 1971; Johnston 1972). The results yielded a direct path between the student teachers' PSTO pretest scores and the cooperating teachers' PTO scores ($r_{24} = .40$). The analysis did not reveal a direct path between the cooperating teachers' PTO scores ($r_{12} = .03$) and the student teachers' scores on the PTO as first year teachers.

Therefore, the data suggest there is a significant relationship between morale scores before student teaching and the students' morale scores after student teaching. The data also reveal that there is a significant correlation between morale scores before student teaching and cooperating teachers' morale scores. And finally, the data suggests that there is a significant relationship between student teachers' morale scores after student teaching and their cooperating teachers' morale scores.

However, the analysis does not reveal that the student teaching experience had much influence on the student teachers' morale. Adding PSTO posttest measures to the model contributed little over what was explained by the PSTO pretest measures. Although the PSTO posttest measures were significantly correlated to the cooperating teachers' PTO scores, the correlation was contained in the previously administered pretest. Therefore, what appears to be a significant correlation between PSTO posttest and cooperating teachers' PTO scores can actually be traced to the influence of the PSTO pretest scores.

Consequently, it may be concluded that student teachers who enter teaching the first year after graduation have fairly stable morale scores before they enter the student teaching experience; and, although the student teaching experience and their cooperating teacher have an influence on their morale, it does not appear to have a lasting effect one year after graduation. The researcher must remember that student teachers included in the development of the path model presented in this paper entered the teaching profession within a year after graduation. Therefore, another path model should possibly be developed for student teachers who did not enter the teaching field immediately after graduation. The students who did not enter teaching were omitted from this model because no scores were available for them on the PTO as first year teachers.

Summary, Conclusions, and Recommendations

There are many possibilities available for the development of path models for the researcher. The blending of theory and statistical techniques in longitudinal research allows the researcher the opportunity to look at the relationship between two variables or the regression of several independent variables and one dependent variable; however, the researcher can also plot the sequential development of the variables in the study and then establish the types of bivariate relationships and possible order of variables represented. Then, the researcher can test the relationship to determine if the paths are null or explore the contribution of variance in one variable that can be traced by analyzing other variables in the model. As more variables are added to the model, the greater the accuracy of statistical calculations and testing the model for closure.

The researcher must also consider sampling variability if the findings of path analysis are to be generalized to the population from which the sample was drawn.

Developing a general path model using longitudinal data that are accessible to the researcher can become a complex task. The researcher must assume the responsibility for making logical decisions as to the type of bivariate relationships that may or may not exist between variables included in the path model. The researcher must then establish the (weak) causal order which is implied in the model.

Decisions must also be made as to which variables should be included in a path model to, in some way, establish at least a partial test of causal closure. As more variables are included in the path model the researcher is able to reduce the proportion of relationships which are decomposed purely on the basis of assumption; and, thus increase the proportion of relationships which are tested for closure.

There are inexhaustible possibilities for the number of variables and types of bivariate relationships which could be identified in the development of a path diagram. For example, based on the longitudinal data available on the student teachers in the College of Education at Mississippi State University who student taught during the fall of 1980, the following variables could be developed into path models:

1. The relationship between the PSTO pretest scores, the PSTO posttest scores, their cooperating teachers' PTO scores, the first year teachers' PTO scores, and the job satisfaction scores, for the student teachers who entered teaching within one year after graduation to develop a five variable model.
2. The relationship between the PSTO scores, the PSTO posttest scores, and their cooperating teachers' PTO scores for all student teachers who completed student teaching.
3. The relationship between the PSTO pretest scores, PSTO posttest scores, their cooperating teachers' PTO scores, and job satisfaction scores for the student teachers who did not enter teaching within one year after graduation.

Although path analysis is not a new technique, it provides a challenging procedure which has not been fully utilized by persons in educational research. Path analysis can provide a new perspective in terms of combining theory and statistics to interpret data. Too many times educational research is limited because the researcher does not look at the total picture implied by the data. Therefore, use of path analysis in future educational studies, especially dealing with longitudinal data, should be given consideraion.

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